The
HEALTH EDUCATION
JOURNAL
A Quarterly for all who are interested in Health

VOL. V. OCTOBER 1947 No. 4

HEALTH IN MIDDLE AND LATER LIFE

"EVERY man desires to live long ; but no man would be old."[1] Yet, as Stieglitz shows,[2] the second half of life is too often spoilt and shortened by prematurely broken-down hearts, kidneys, blood vessels, joints, stomachs, ductless glands. And of those who survive to old-age only a minority retain reasonable vigour of body and a hopeful and still adventurous mind.

How much of this untimely decay is preventable? It is difficult to say. Examinations of ageing men and women and of those who have died in old age suggest that deteriorations of structure and function are characteristic of the later phases of life. But the age of onset and the extent of these changes vary strikingly in different individuals. Indeed some long-lived people seem to escape them entirely. And experimental work indicates that they can at least be delayed by controlling the environment throughout life.

The determining factor is therefore the interplay of constitution and environment. Those who break down prematurely may have an inborn relative weakness of some organ or system, but that potential weakness betrays them only because the long-continued play of environmental stresses has exposed it.

What are the damaging stresses? Unfortunately the seeds of the chronic and progressive disorders that appear in middle and old age are usually sown so many years—perhaps decades—earlier, that it is as yet impossible to say. Moreover, the irreversible tissue changes and the grosser symptoms and physical signs are preceded by subtle changes of structure or of physiological function and reserve that are at present immeasurable or can be detected only by delicate tests. So the attack on these diseases must be preventive rather than curative.

There is growing evidence, however, that many complex factors of constitution and environment are involved. Such general factors as mental health, nutrition, sleep and recreation are undoubtedly important. So the diseases of degeneration may conceivably begin to take shape even in childhood. Here then is another reason for redoubling our efforts to ensure by health education a healthier way of life for all children and an extension of healthier living into young and mature adult life.

[1] Swift: *Thoughts on Various Subjects, Moral and Diverting.*
[2] See pages 151–6.

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IS LIFE WORTH LIVING?

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Is Life worth living? The witty answer that it depends upon the liver is as true as it ever was in the mental sense, though the organ called the liver is no longer regarded by the profession as having much, if any, effect upon the emotions. The World is an interesting place for interested persons. Interested in what? The answer is in something more than themselves. We cannot escape the conclusion ; the answer to the question as to the desirability of living is an ethical one. We must be interested in something other than ourselves, and more particularly in other people. And once we have begun to expand the sphere of our interest in others there can be no *logical* limit. This is the basis of mental health to the same degree as it is the basis of ethics.

I know an old lady who, in rapid succession, lost her only child, her husband, her greatest friend and, finally, her eyesight. But she remained cheerful and interested in her surroundings ; she can describe, as vividly as if she had seen them, the day's happenings, as they affected those in whom she is interested, and many younger people seek and enjoy her company. It is her interest in others that keeps her cheerful. This happy state may be contrasted with the lot of many old people, who, retiring more and more into themselves, become lonely and querulous, even though they retain their eyesight.

Birth of Humanity

It was a wonderful day when some reptile took it into its head to sit upon its eggs and hatch them out, rather than to leave them to hatch out in the hot sands, as did the dinosaurs ; that day the dinosaurs were doomed to disappear, and in course of time did so. That day, in embryo, was born the Nightingale, telling of father love as well as of mother love. But mother love had still two other great steps to take ; firstly to nourish the eggs within the mother's womb, and secondly to nourish the young, after birth, at the breast. Without these steps humanity could not have arisen nor family life have existed. And from the family grew the pack and the herd, socially organised for attack and defence respectively, and the agricultural community, the village, the town, and the nation, organised for the production of food, for trade and for government. The basis of all this is mother love.

" Man," said Aristotle, " is a social animal," thus summing up in a sentence the evolutionary process described in the last paragraph. The

potential capacity for mutual combination has the power of an instinct, an urge to be disobeyed at our own peril of mind. It is no accident that the dog, the ox, the horse, the sheep, man's domesticated animal companions, share with him this gregarious instinct. If we limit in any way the range of our co-operation, to that degree we thwart this urge. The greatest minds have always expanded their sphere to include the whole of mankind within its co-operational orbit. There is no other logical limit. When we make barriers of whatever kind to the range of our potential co-operations, barriers of age, sex, class, race, colour, religion, or creed, we simultaneously make barriers for our own happiness and peace of mind. When Hitler excluded the Jews from his definition of mankind, terming them sub-human, he took the step which quite logically led him to self-destruction in the Chancellery bunker.

The new-born babe knows none of this. Its immediate instincts are for self-preservation. A pigmy in a world of giants, it needs from moment to moment, food, warmth, security, reassurance. And it is the instinct of every mother to give her child these things. But in the upbringing of her child wisdom is needed, as well as instinct, and wisdom may be wanting, for all mothers are not, by instinct, wise. No child can be too much loved, but the love may be unwisely bestowed, may indeed be tinged with selfishness, and not be all selfless. Unhappy the unwanted child, for not to be wanted is the very travail of the soul. Unhappy the child that is the bone of contention between its parents, the pawn in the game of marital quarrelling, perhaps taught to be a disloyal go-between, playing off one parent against the other. Can such circumstances be a good foundation for a worthwhile life? They shake the foundations of personal security, replacing it with insecurity, which is a form of fear. And the reactions of the mind to continual fear are mostly bad.

The Mother's Task

The child's first mental need is, then, security. But even in the giving of a sense of security there are pitfalls for young feet. For those young feet have a long road to tread, and the mother's hand will not always be there to pick her baby up when he or she falls down. Just as physically the child learns to walk by holding his mother's hand, but soon learns to run by himself, so in the mental sphere he must be prepared to walk by himself in new and strange surroundings and not to be afraid. Courage can, and should, be taught. Step by step, as the child grows more firmly established in his sense of security, he must be not only permitted but encouraged to interest himself in a wider world of things and, especially, people. In this the mother must not be jealous or

restrictive in outlook. She must not be possessive, keeping the child to herself, nor permit him to be too possessive, regarding the mother as his property. For human beings are not, and should never be regarded as, chattels. The too possessive mother, limiting the child's sense of security to herself, will give that child a sense of insecurity away from her. That child will not be a good mixer ; perhaps not even a useful citizen. During the last war it was found, only too often, that the basis of neurosis was not the fear of death or wounds but the spoilt child's insecurity away from its mother. In the long run, everyone has to be responsible for his or her own actions ; so it is the mother's task, by gradual degrees, to give her children increasing responsibility towards their daily duties and towards others. Thus will the child become more self-reliant and trustworthy.

The Father's Share

In this task the mother will interest the child in its father as well as in herself, putting jealousy out of her heart even in the case of a daughter. It is well if the father, from the very beginning, shares with the mother the onus of the child's care, thus increasing the child's range of interest from the start. And when a second child is on the way she will, if the first-born is not too young, prepare him for the advent of a new playmate. Then, if the father has a secure place in the first-born's interest, the blow of the mother's devotion to the needs of the new baby will be softened. For the first-born is then in the position of a dethroned monarch, no easy position for an adult but one in which the child may suffer much if he is ill-prepared. From having been the centre and focus of interest he becomes a second-rate actor ; and we all love the limelight. The mother will be careful, as occasion permits, to show and prove to the elder child her continued love. So will the foundations of the first-born's security be not too rudely shaken. The ante-natal clinic is the place where this advice may be given to the mother, and the process of mental weaning should be started in the early months of pregnancy. The symptoms of this jealousy may be various, often taking the form of a return to more babyish ways, such as bed-wetting, trying to suck from his mother's breast or wanting to ride in the perambulator. He may be encouraged to take an active interest in the baby, to do such little things for it as are in his capacity. In this way he may learn two of the most valuable lessons tending to his future happiness, to be self-reliant and to be less self-centred.

Lack of Parental Interest

One of the features of our towns is the presence of gangs of youngsters, largely boys, who roam the streets at night. Here we have a very

limited sphere of co-operation, if the noisy association of discordant and mutually contending gangs can be thought worthy of that word, and the outlook is largely anti-social. It is easy to attribute this behaviour to the lack of room in the home or elsewhere for the youngsters to play, and this is doubtless in many cases true and, further, there is a natural tendency in adolescence to seek wider fields than the family affords ; but an acute observer has noticed that this type of behaviour arises when the parents, and more especially the mother, ceases to take an interest in the children as they grow up. They then go out into the World inadequately trained in co-operation and social interest. Gangsterism is then the opposite failure to the product of the over-possessive parent. Lack of interest in others may arise from either cause. Wisdom must steer a midway course and the parental interest must never seem to fail.

Development Within the Family

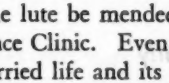
For the child the family fellowship of brothers and sisters is most salutary. The only child is apt to consider itself the only pebble and to demand a limelit stage on which to act. The give and take of approximate equality in needs and desires amongst one's brothers and sisters is worth more than an education at Eton and Oxford. To be interested in one's sibs is the introduction to an interest in the larger world of school, work and marriage. So step by step should an expanding interest in others be taught. The capacity for social interest is potential but the practice must be inculcated, by example as much as by precept. The average family unit of three or four, necessary to meet the population needs of the country, is equally desirable for the psychological needs of the children.

It follows that parents cannot escape responsibility for the mental welfare of their children any less than for their physical welfare. True we cannot fully disentangle the warp and weft of heredity and environment, though the study of identical twins who have been separated from birth shows that, in matters of temperament, environment is more important than heredity. Be that as it may it is family environment which is the controllable factor in mental hygiene. Controllable, but controllable only in part and not *in toto*. For in matters of the mind cause and effect do not follow with the certainty of a chemical experiment. There is a statistical probability but no certainty, and some of the most beautiful flowerings of the mind have bloomed in apparently desert surroundings. The principle of uncertainty applies to the field of human behaviour just as it does in that of sub-atomic physics. Nevertheless, the pithy remark "good calf, good cow," does in the main hold good ; and on the other side of the picture we see in some problem families the worthless

heirloom of an atrocious upbringing handed on from generation to generation.

Training for Living

The family is the unit of society, the source of most health and much disease. But it is incomplete by itself. Man is a social being and his life needs integration into a larger world to reach its full fruition. This is, in essence, the lesson of the experiment of the Peckham Health Centre. And that experiment carried also this further implication that men and women can, in appropriate surroundings, effect that further integration to their own increased happiness and health, in adult life ; in regard to the Peckham Health Centre one is bound to add that only some of them did, for others left the Centre too soon. How much more easily can the little rifts within the lute be mended in earlier life, as can often be done in a Child Guidance Clinic. Even better should not we endeavour to train parents for married life and its responsibilities *before* marriage? Should we not ask that the Denning Report should be implemented and that every help should be given to those devoted workers who are willing to take on the onerous task of marriage guidance? Is there anything we can do for our fellows better than to make life for them worthier of living?



BIOGRAPHICAL NOTES

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Hlth. Educ. J., 1947, 5, 151—156

PREVENTIVE MEDICINE IN LATER MATURITY

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Geriatrics, or that part of medical practice concerned with the ageing and the aged in both normal senescence and illness in later years, can be said to owe its existence to preventive medicine. The tremendous reduction of deaths in infancy and youth which has marked the last fifty years is attributable chiefly to preventive activities. Improved sanitation, quarantine and isolation of contagious patients, prophylactic immunisation and prompt institution of specific therapies have dramatically lowered infantile and juvenile death rates. As a result, many millions of children who formerly would have died in youth have survived into later maturity. Though the ageing and the aged have always been with us and have always presented clinical problems peculiar to senescence and senility, it is only recently that the study of these problems held more than academic interest. The present rapid expansion of interest in geriatrics has a decidedly pragmatic foundation.

It is only within the last fifty years that the elderly have become a significant numerical fraction of populations. Increasing longevity is world-wide, though there is considerable asymmetry among various nations. Australia and New Zealand lead: in 1942, the average duration of life was 65 years. The United States is close behind with an average length of life of 64.82 years in 1942, Great Britain 62, Italy 55, Japan 48, and British India 27. The most recent data for the United States reveal that in 1944, the average length of life was 66.25 years. This represents a gain of 17 years since the turn of the century, when average longevity was 49.25 years. Most of these gains are due to a reduction in infant mortality. There is some increased expectancy in later years. In the United States the average expectancy of women aged 40 in 1945 was 34.4 more years; the average for men aged 40 in 1945 was 30.6 years. For those aged 65 in 1945, the men will average 12.2 more years of life, the women 14.3.

Looking at the changing picture of humanity from another angle, one is impressed by the rapid ascent of the median age of the American population. The median age in the United States increased from 26.4 years in 1930 to 28.9 years in 1940. An increase of two and one half years in median age in a single decade cannot be ignored. The civilised world is entering upon an age of age.

Is Survival Enough?

The situation is without historical precedent and at first flush seems to be cause for triumphant congratulations on the accomplishments of medical science and practice. But mere survival is not enough. The picture is not as happy as it should be. Were most of the increasing millions of elderly persons well, vigorous and strong, we could truly rejoice and anticipate an era of wisdom, peace and plenty. But they are not. Instead, beset by chronic and progressive disorders which lead to accumulative impairment and disability, too many older people become at least partial invalids, often protracted burdens to themselves, family and community. The need for increasing knowledge of the biology of senescence and concerning the degenerative disorders so common in later years is truly urgent. Life is more than length. It should have also depth and breadth. Longevity without health can be a dreadful curse to the individual, the family and the community. Longevity with health and continued usefulness is a priceless privilege.

Illness in Youth and Age

Past and present preventive medicine has focused its attention upon infective diseases, battling to remove hazards from the environment. Such strategy has been marvellously successful in preventing disease due to influences arising outside the individual. But mere extension of these tactics cannot solve the present and future problems presented by the chronic and progressive degenerative diseases of later years.[1] New methods are needed. The illnesses of youth and of senescence differ widely and thus require equally divergent preventive strategy.

It is essential that we recognise that the chronic progressive diseases, such as arteriosclerosis, high blood pressure, arthritis, diabetes mellitus, gout, cancer, and chronic kidney disease are the outcome of a number of obscure factors arising largely within the individual himself and accumulating over a considerable period of time.[2] The causes, therefore, are usually not amenable to control by measures directed against the external environment. As *all prevention must be based on cause,* these characteristics of the so-called degenerative disorders are particularly important. These diseases actually begin years before they become clinically obvious. It is necessary to keep in mind that each individual instance of a given disorder, such as high blood pressure or diabetes mellitus, results from a long series of superimposed factors and that these factors are very rarely identical in any two cases. Thus a diagnosis of the causes requires a high degree of individualisation and much more diligence and diagnostic acumen than is necessary, for example, to dis-

cover the cause of an acute rash in childhood. Identification alone suffices in the latter instance.

Prevention of the chronic disorders common in later years will be possible only if the initiative is taken by the patient. In this respect preventive medicine for adults differs greatly from that for children and younger people. Individual variation and the insidious onset of these disorders tend to delay medical consultation, and thus make an analysis of the underlying causes even more difficult.

Characteristics inherent in the senescent individual also obstruct prevention of degenerative disease. Older persons are changed, both functionally and structurally from what they were in youth. They are not the same people, just a little bit older. These changes, which we cannot enumerate here, alter the reactions to disease, change the symptoms and affect both the treatment and the outlook. Study of these changes and their significance is an obligation of every physician, for without an appreciation of the changes introduced by ageing, gross errors in diagnosis and management are inevitable. The greatest advances in both the prevention and treatment of children's diseases were made when it was at last recognised that the child is not merely " the little man," but presents structural, functional, nutritional, mental and immunologic *attributes peculiar to his age*. Precisely the same concept forms the foundation-stone of geriatrics.[3]

The Health Inventory

The future of preventive medicine as applied to adults has for its basis the periodic health inventory. As we previously stated, the initiative must be taken by the patient in order to obtain individual guidance toward maintenance of health. The choice of the term health inventory is deliberate, for the procedure should be much more than a mere physical examination. Periodic examinations have fallen into ill repute in many quarters, largely because too many were carelessly and superficially conducted and because too little use was made of the information elicited. The average physician has been prone to say, " I can find no disease ; therefore you are well." In contra-distinction, the objective of a health inventory is measurement of health. Health is always relative and therefore there is always room for improvement. We should be vastly more concerned with the patient than with his disease.

Early discovery of impairments in health, so that they may be arrested by proper guidance, depends upon the measurement of functional reserve capacities. If we wait for the appearance of frank clinical signs and symptoms of functional failure we will have waited much too long for prevention. Early lowering of reserves does not as a rule produce

subjective symptoms and can be revealed only by noting the physiologic responses to conditions of stress. Examination of the heart during rest, no matter how thorough, cannot reveal the ability of this vital organ to respond to increased effort. The essence of health assessment is testing functional reserves by deliberately inducing conditions of stress. This basic principle applies particularly to disorders involving the cardio-vascular-renal system, metabolism and nutrition.

The second function of the periodic health inventory is that of guidance. Obviously the whole benefit derived from periodic consultation depends upon the wisdom, appropriateness and feasibility of the advice presented. It is equally obvious that the ability to offer valuable guidance depends upon the doctor's ability to diagnose the basic causes of the troubles and to foresee their probable progress. We do not yet fully appreciate how much mature adults can be helped toward more nearly optimum health by personal and individual periodic guidance.

Constructive Medicine

Humanity exhibits tremendous inertia against all types of preventive activities. This is in part attributable to the fact that the benefits of prevention are indirect and can be revealed only statistically. Statistics have almost no emotional appeal. We cannot tell people that unless they carry out preventive activities they are sure to get into difficulty, for that is not true. We can say only that a certain number of so many thousand individuals will be benefited, but we cannot predict just which ones these will be. Therefore, continuing to offer adults preventive medicine as it is now understood will probably accomplish very little, for the great majority of people will continue to assume that luck will be on their side. However, if we merely change the phraseology and broaden our meaning of prevention, there is hope that much can be accomplished for those in later maturity. Let us take as our major objective *the construction of greater health rather than the avoidance of disease,* something which is personal and individually demonstrable. Preventive medicine has a negative connotation ; constructive medicine is positive. The concept of health construction as a phase of medical practice is not new, though the phrase is. Paediatricians have demonstrated that it is possible to make well babies healthier. There are no reasons whatever why it should not be similarly possible to make relatively healthy adults healthier. Personalised guidance toward a more nearly optimal nutrition, better balance between work and rest, more individually appropriate exercise, wiser mental hygiene, and early discovery and prompt correction of minor disturbances, such as foci of infection, moderate degrees of anaemia, obesity and the like, can certainly do much to improve health in the later years of life.

It must not be imagined that we expect periodic health consultations to prevent all illness. This is impossible. But if properly applied, such personal preventive medicine can improve the health of an individual so that if he does become the victim of some illness or accident his chances and speed of recovery are greatly enhanced ; increase his work efficiency, usefulness and sense of well-being ; retard the progression of chronic disorders common in senescence ; and add to the length, as well as depth and breadth of life. It is a fundamental principle of geriatrics that in older people the outcome of an acute illness depends just as much upon the condition of the patient prior to the disorder as upon what specific treatment may be applied during its course.[3]

Difficulties to be Overcome

A scheme of preventive medicine in later years, such as we have suggested, however, is not without its limitations and obstacles. Though these are serious, they should not prove insurmountable. The greatest difficulty is the inertia previously mentioned, coupled with the fact that the initiative must be taken by the people themselves. It will take a long and arduous campaign of *education* to counteract this inertia and to establish in the minds of men and women the idea that their health is their own personal responsibility. Health cannot be *given,* even in the most Utopian state. Health must be *earned.* To a great degree, public health measures and sanitation have been effective because they involve neither initiative nor effort on the part of the beneficiaries. Furthermore, their cost per capita has been negligible. Personal health services are more expensive. Proper personal health construction requires a high degree of individual attention, time consuming thoroughness and unusual skill on the part of the physician to detect subtle and insidious changes. However, if it can be demonstrated that the benefits are as splendid as we have reason to believe they will be, relatively high cost should not prove too serious a handicap. Individualisation is an absolute necessity ; with increasing age there occurs an increasing divergence between individuals. We are what we are to-day largely because of what we went through yesterday, and each one of us has had a different series of yesterdays.

The third difficulty to be overcome is lack of knowledge. We need to know very much more regarding the differences between normal, or average, and optimum. For example, for many years it was assumed that just because the majority of people tended to gain weight in later maturity this was a normal phenomenon. Recent studies conclusively demonstrate that though such a gain in weight is common, it is distinctly undesirable and affects morbidity and mortality adversely. There is

also need for improvement in diagnostic methods, particularly for the development of stress functional tests to reveal depreciations of the different reserves. Our present ignorance regarding the causes of most of the chronic progressive disorders of later maturity is a serious handicap. However, better application of existing knowledge through education can accomplish much. These disorders start insidiously years before they reveal themselves by subjective symptoms ; prevention must be early.

The Ultimate Goal

The ageing and the aged are already here in greatly increased numbers. There will be more and more of them as time goes on. The hope of longevity has become a reality. But length of life without depth, breadth and continued usefulness is a hollow victory. The insidious sabotage of chronic and progressive disorders has prematurely invalided far too many of us in the second forty years. Characteristic of these disorders is that they progress silently until damage is irreparable and disability inevitable. Mortality data are misleading. We need to study also the degree and duration of disablement produced by such diseases as arteriosclerosis, arthritis, and high blood pressure. The cost in time, effort, pain and money of these disorders is beyond calculation. Their prevention and control must be individualised. Much unnecessary chronic illness in later years can be prevented by more thorough and more widespread application of present knowledge. Man can, and does, tolerate an immense amount of abuse, but he will remain well, vigorous, and useful much longer if he learns how to *use* rather than *misuse* the biologic organism that constitutes his endowment of mind and body. Health is a privilege, not an inherited right. Privilege and responsibility are inseparable. Therefore, we cannot escape the obligation of effort required to maintain health.

The objective is not merely prolongation of life, but enhancement of vigour and functional capacities to the point where we all remain useful until truly senile. For the individual this means much, because the major tragedy of old age is the sense of uselessness, of being unnecessary. For the community, the nation and the world it can mean that we may hope to have a more mature population and therefore, ultimately a peaceful world. Youthful scientists may explore the physical world about us, but only fully mature men and women can reveal to the full the splendid potentialities of mankind.

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Hlth. Educ. J., 1947, 5, 157–160

SELECTING YOUNG WORKPEOPLE

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Much was said and written during the nineteen-thirties about the desirability of improving the ways in which young people are chosen for their first jobs ; but, although the inadequacy of the casual methods then in use was demonstrated over and over again, comparatively little was done, except by a few large industrial undertakings, to bring about an improvement.

After the collapse of France in 1940, however, a considerable change took place in the British attitude to the techniques of personnel selection, and subsequently young men and women were given psychological examinations in the Fighting Services to the number of several million. In consequence the application of measuring devices in vocational selection has ceased to be a novelty in this country.

Another progressive step was taken in the recent Education Acts in which it was specified that all pupils, when leaving school, are to be given Vocational Guidance. Shortage of qualified staff, besides other limiting factors, will prevent this being done on an extensive scale for some time, but the intention is there and must influence in the future the attitude of all employers to Vocational Selection.

We do not want to see institutes of psycho-technik rise up in this country on the model set by Germany. Instead of the youngsters going to one of these central testing laboratories we would prefer to have them advised in their own schools ; and we are not favourable to the idea that employers, when engaging young people, should be supplied with the information, at least in detail, which the schools have gathered together about each individual. Rather would we have employers conduct their own examinations, using tests and other means of assessment designed specifically to meet their own requirements.

The Interview

In the main, however, employers will no doubt continue to attach considerable importance to the interview. And industrial psychologists would not have it otherwise. They recognise that success in a job is determined to a large extent by temperament characteristics which cannot be measured by means of tests—this being, by the way, one of the principal

differences between the standpoint of British and German industrial psychologists.

On the other hand, however, there must be recognition that the methods used by many people in conducting interviews are crude to the extent of being valueless and misleading.

The use of a standardised interviewing technique is not recommended, although few perceive their proneness to standardise their own procedures by repeating stock questions, instead of adapting their methods to suit the individual peculiarities of each applicant. And there is certainly not a common understanding that talkative people often interview themselves instead of the young people, and then give recklessly sweeping decisions based upon what are really the flimsiest of grounds.

With the recent advances made in personnel management most of the dangers associated with bad interviewing will probably disappear, as these matters will presumably be left to people who, if not trained in how to interview, will have at least some knowledge of the framing of questions and the interpretation of answers.

Intelligence Tests

At present the conception of psychological testing is dominated by the measuring of intelligence, the general cognitive factor. But much harm has been done by those who, in their enthusiasm, have used the wrong kinds of tests, or, in fact, used intelligence tests when such things were inappropriate.

Although some psychologists disagree, most people engaged in industry believe that, while booklets containing verbal tests of intelligence—synonyms, antonyms, analogies, etc.—may have their uses in selecting clerical and sales staffs, they are of little value in selecting workers for practical operations. During the war attempts were made to overcome this difficulty by substituting pencil-and-paper tests, with simple visual patterns taking the place of words. Some personnel managers press for the introduction of performance or 'doing' tests, such as are used for younger pupils, but it is not easy to do so, and while certain tests, such as form boards and cube construction, are available, they are rarely used together in groups.

In recent years, however, quite another point of view has been expressed—to what extent is intelligence called for in carrying out many industrial operations? If the most intelligent out of, say, five applicants is chosen for a particular repetitive job, to what extent may it be assumed that the most suitable of them has been chosen? The opinion is growing that, while a high level of intelligence is essential for doing some jobs, it is a disadvantage for others—that, in fact, a person can be too intelligent as well as insufficiently intelligent for some kinds of work.

Analytic and Analogous Tests

In place of general intelligence tests, others may be used, specific to the kind of work to be undertaken. There are two ways in which such tests may be prepared—on an analytic or an analogous plan.

The former method involves an analysis being made of a particular operation, to arrive at, say, six or seven abilities, usually manual, needed for doing the work satisfactorily. An example is provided by the packing of a certain kind of biscuit which, it may be found, calls for finger dexterity, size and control of grasp, hand-and-eye co-ordination, estimation of sizes, and observation of defects in quality, colour and size. Tests, either of a standard kind, or specially prepared, would then be adopted for experimental purposes, and eventually a battery of tests along these lines would be handed over for the personnel manager's department's use. From time to time their effectiveness would be checked against the actual achievements, good and bad, of those selected by this means.

The extent to which our understanding of general and specific manual dexterities warrants making analyses such as these at the present time is debatable, and in recent years there has been a movement in favour of analogous tests—which reproduce in simplified form, and perhaps in miniature, the actual operations.

For crafts and trades, at which an apprenticeship has to be served, as distinct from occupations requiring a few specific skills principally of a repetitive manual character, some standardised tests of, say, mechanical ability, ability to perceive form relationships, and general manual dexterity are most likely to be preferred, with the addition of an intelligence test, some tests of physical characteristics such as vision, and a review of scholastic achievements.

The selection of young clerical workers is usually freer of complications, for, not only is a verbal test of intelligence more appropriate, but very good booklets of tests of clerical ability are available. Most uncertainty attaches to the selection of young people for the sales occupations, in which temperament characteristics contribute so much to success. Apart from a few tests of arithmetical and other scholastic abilities, the staff manager is likely to rely, wisely or not, on his own capacity to interview people, supplemented by the use of a few prepared situations, such as asking each applicant how he would try to sell him, the staff manager, the ink stand on his desk.

Reducing the Number of Misfits

Psychological testing is still in its first stages of development—no one except a few misguided enthusiasts claims otherwise. And it would not be right to suggest that outstandingly rapid progress is likely to be made

during the next few years towards increasing reliability and validity. Indeed, there are some who emphasise the necessity for first improving the methods of interviewing.

A considerable quantity of evidence has been gathered over the last twenty years showing that, even at this stage, the number of misfits in a factory, or in a group of occupations, can be considerably reduced by the proper use of methods of selection. There is, of course, no general agreement about how many misfits there are at present in industry. Some put the percentage as low as five and others as high as fifty. No matter what criterion is used, however, the introduction of a vocational selection technique in a factory will, even now, considerably reduce the percentage —and will eventually, with growing experience, cut it down to a very small figure.

BIOGRAPHICAL NOTES

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EFFECT OF LEVEL OF NUTRITION OF EWE DURING PREGNANCY
UPON SIZE OF LAMBS AT BIRTH
ALL TO SAME SCALE

91 DAYS AFTER SERVICE

144 DAYS AFTER SERVICE

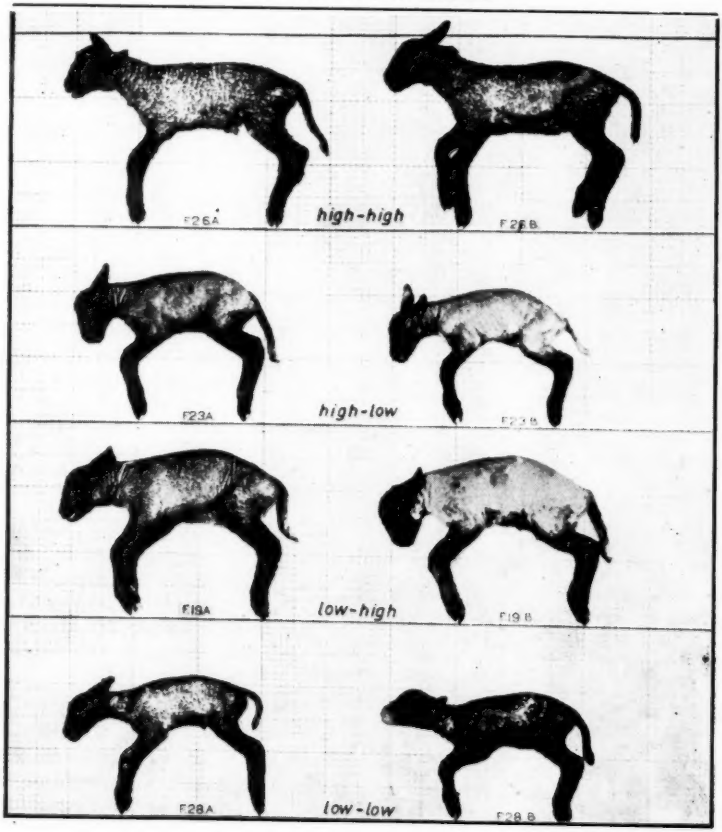

Fig. 2

(See page 161)

EFFECT OF LEVEL OF NUTRITION OF EWE DURING PREGNANCY
UPON GROWTH OF MAMMARY GLAND
ALL TO SAME SCALE

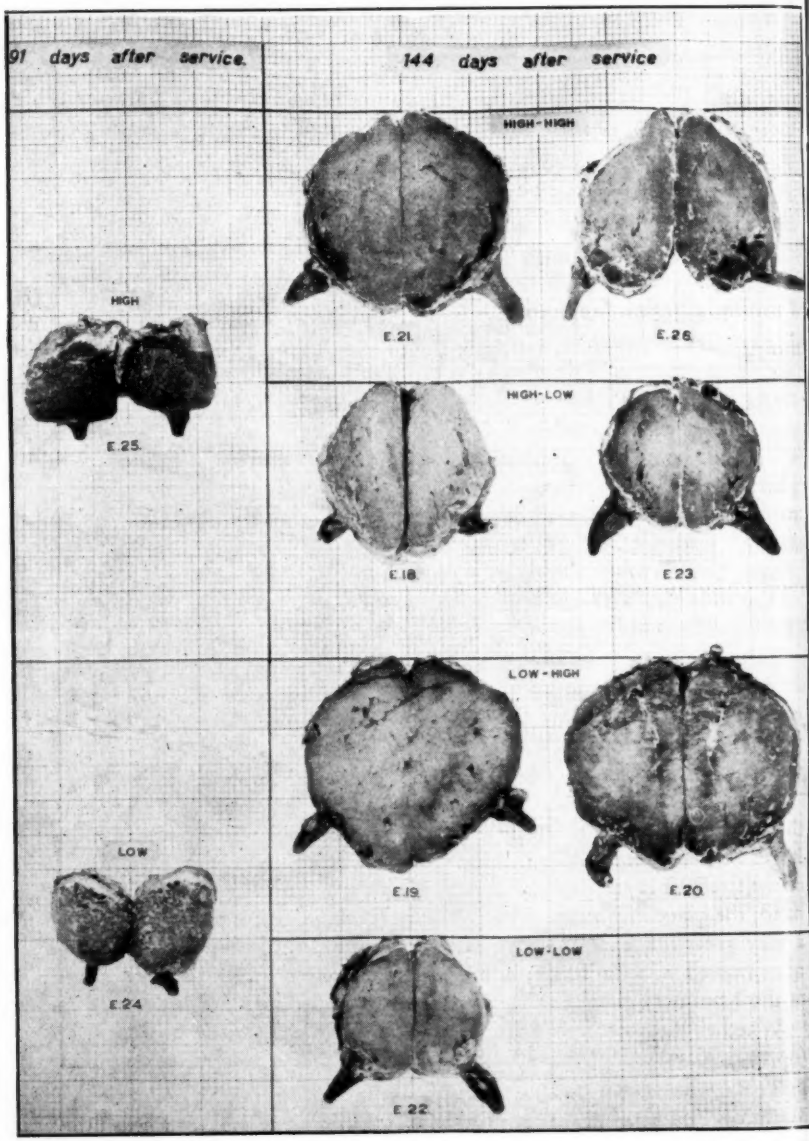

Fig. 3

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NUTRITION AND HEALTH IN ANIMALS

By JOHN HAMMOND, M.A., D.Sc. (Iowa), F.R.S., *Research Physiologist, Animal Nutrition Institute, School of Agriculture, Cambridge.*

EVERY year large numbers of newborn sheep, pigs and cattle perish shortly after birth because the young are born in a weak condition or because the mother has not enough milk to feed them properly in the critical period shortly after birth.

Feeding During Pregnancy

How far is this due to the methods adopted in feeding the mother during pregnancy? To answer this question experiments were undertaken by L. R. Wallace (*J. agric. Sci.*, 1948) with sheep. In this species pregnancy lasts about 148 days. During the first 90 days or so the placenta and fluids grow considerably, but the fœtus itself, and the mammary gland make little increase in weight. Growth of both the fœtus and mammary gland, however, is rapid during the last eight weeks of pregnancy. Experiments were therefore designed to show how the level of feeding in these two different periods of pregnancy affected the strength of the young at birth and the development of the mammary gland. By feeding different amounts of a good ration composed of all the ingredients at present known to be necessary, the pregnant ewes were made to vary in weight during pregnancy as shown in Fig. 1 (p. 162). Some ewes in each group were killed at the 91st day of pregnancy while the remainder were killed at the 144th day, which was some four days before parturition was due.

From Fig. 2 (Fœtuses) and Fig. 3 (Mammary glands) it will be seen that the plane of nutrition on which the ewe is fed during the early stages of pregnancy (up to the 91st day) makes no difference to the size of the fœtus or to the development of the mammary gland. On the other hand, the plane of nutrition during the last eight weeks of pregnancy has a very great influence on the size of the young (about 6 lb. for the low as compared with 12 lb. for the high plane diet) and on the development of the mammary gland.

Whether the mothers were fed well or badly during early pregnancy (up to 91 days) a high plane of nutrition during the last eight weeks of pregnancy has given large, strong young at birth and well developed mammary glands, while a low plane of nutrition during this time has given small, weak young and poorly developed mammary glands. In

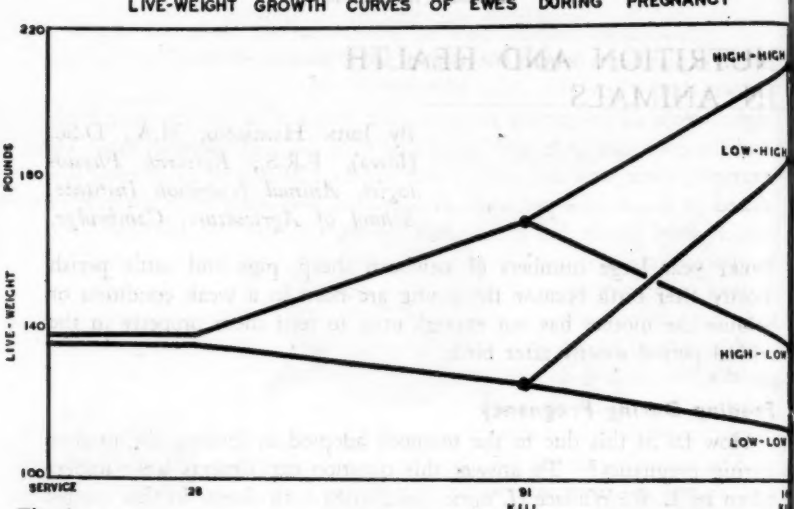
LIVE-WEIGHT GROWTH CURVES OF EWES DURING PREGNANCY
220
180
140
100
POUNDS
LIVE-WEIGHT
HIGH-HIGH
LOW-HIGH
HIGH-LOW
LOW-LOW
SERVICE
28
91
KILL
DAYS PREGNANT

Fig. 1

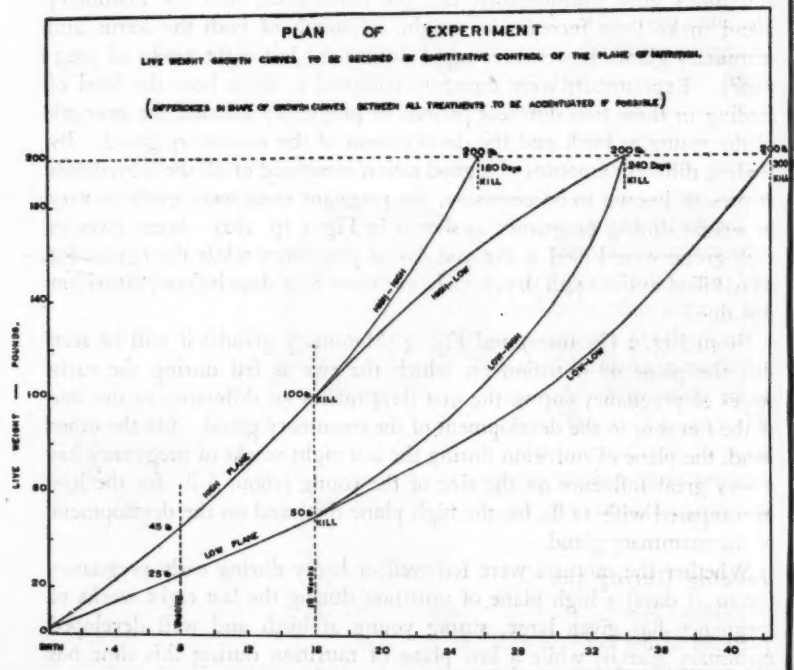
PLAN OF EXPERIMENT
LIVE WEIGHT GROWTH CURVES TO BE SECURED BY QUANTITATIVE CONTROL OF THE PLANE OF NUTRITION.
(DIFFERENCES IN SHAPE OF GROWTH CURVES BETWEEN ALL TREATMENTS TO BE ACCENTUATED IF POSSIBLE)
200 lb.
180 Days
KILL
200 lb.
240 Days
KILL
HIGH-HIGH
HIGH-LOW
LOW-HIGH
LOW-LOW
100 lb.
KILL
50 lb.
KILL
45 lb.
25 lb.
HIGH PLANE
LOW PLANE
LIVE WEIGHT — POUNDS.
BIRTH
AGE — WEEKS

Fig. 4

other experiments where the young were born and reared it was also shown that where the plane of nutrition was lowered during the last eight weeks of pregnancy many of the young died shortly after birth, and the ewes had little milk compared with the high plane group. For example, ewes well fed during the last eight weeks of pregnancy produced 50 lb. of milk per week as compared with only 30 lb. from those which were poorly fed during this period. Where the ewe was fat at mid-pregnancy and was put on a low plane of nutrition during the latter part of pregnancy cases of pregnancy toxaemia occurred in the ewe, but this did not occur where the ewe was on a low plane of nutrition in both early and late stages of pregnancy. Sections of the livers showed that in the high–low group of ewes there was a large accumulation of fat, whereas little or no fat was found in the high–high or low–high groups. In the low–low groups there was a small amount of fat only in the liver.

The mortality among the lambs from the ewes which had been badly fed during the last eight weeks of pregnancy is probably due to their body heat-regulating powers not being properly developed, since this is a body function which develops only about the time of birth. Although the ewes were all killed on the 144th day from conception, anatomical investigation of the different parts of the body of the lambs showed that those from ewes on a low plane during the last eight weeks of pregnancy were anatomically (and probably physiologically, also) only about 130 days old, whereas those from the ewes on the high plane during the last eight weeks were some 160 days old. It seems probable that good nutrition of the mother during the latter stages of pregnancy speeds up development in the young so that its powers of maintaining life after birth are increased, whereas poor nutrition of the mother during this stage leads to the birth of ' premature ' young in spite of the fact that parturition takes place at the normal time after conception.

In applying the results obtained in one species to another species (in the absence of direct experiment in the second species), consideration has to be given to the differences in the physiology of the two species. In this case, for example, the lamb is normally born at a more advanced stage of development than the child and, while there can be no doubt that the same general principles apply in both cases, the degree of effect and time relations may vary between the species.

Feeding During the Growing Period

Perhaps few people realise the extent to which the size and the proportions of the body can be affected by the plane of nutrition on which the animal is reared.

The growth impulse is greatest during the early stages of life and

wanes as the animal grows up. The rate at which it wanes, however, varies greatly in the different areas and tissues of the body and so changes in body and tissue proportions occur at different stages of growth. Thus brain and eyes grow early in life and the proportions of the cranium in the young animal are high, while the rate of growth in this part wanes quickly as compared with other parts such as the body length and chest depth: the proportions of the cranium and eyes are therefore reduced in the adult as compared with the infant.

The order of the growth of the different tissues of the body is, in general —brain, skeleton, muscle, and lastly fat. In order to determine how far the plane of nutrition on which the animal is reared can affect the body proportions and composition, C. P. McMeekan (*J. agric. Sci.*, 1939–40) devised an experiment with pigs in which he controlled the rate of growth at different phases of life by feeding the animals different amounts of a good, well-balanced ration, containing, so far as is known, all the essential ingredients.

His experiments were done on an inbred strain of pigs in which the variation due to genetic causes was small; in addition, individual members of one litter were divided among the different treatments. Animals from each litter were made to grow along different, predetermined growth curves, as shown in Fig. 4 (p. 162), by feeding different amounts of the same ration at the appropriate periods.

At 16 weeks old, not only were there differences in the size of the pigs (120 lb. on high plane feed as compared with 60 lb. on low plane feed—see Fig. 5, facing p. 176), but the body proportions of those on the high plane feed were much more advanced for their age than those on low plane feed (see Fig. 6, facing p. 176). When the plane of nutrition is lowered it would appear that the early developing parts (such as head and eyes) have priority of supply and continue to grow (but at a slower rate), while the later growing parts (such as the thorax and loin) are very limited in supply and so are very much under-developed (see Fig. 7).

After 16 weeks two pigs in each litter were continued on high (HH) and low (LL) plane feed respectively until they reached 200 lb. body weight, the former at 168 days and the latter at 315 days old (see Fig. 8, facing p. 177). Low plane nutrition prevents the proper development of the later developing parts of the body and suppresses the expression of the full genetic capabilities with which the animal is endowed.

Now let us examine the changes which take place when the plane of nutrition is changed during the course of growth.

During the early phases of life, up to about the 16th week, the skeletal and muscular framework of the animal is making the most rapid increases, while after this time the rate of growth of these tissues slows down and fat makes its most rapid increase.

When the animal is fed well in early life it makes, therefore, as large a skeletal growth as it is genetically capable of, while if it is badly fed the skeletal and muscular growth is stunted. If these stunted pigs are then (at 16 weeks old) put on a high plane of nutrition they increase rapidly in weight but this increase is largely fat for the time of rapid skeletal growth has passed and a small-boned, fat pig is produced (LH, Fig. 8). In the pigs which were fed on a high plane of nutrition in early

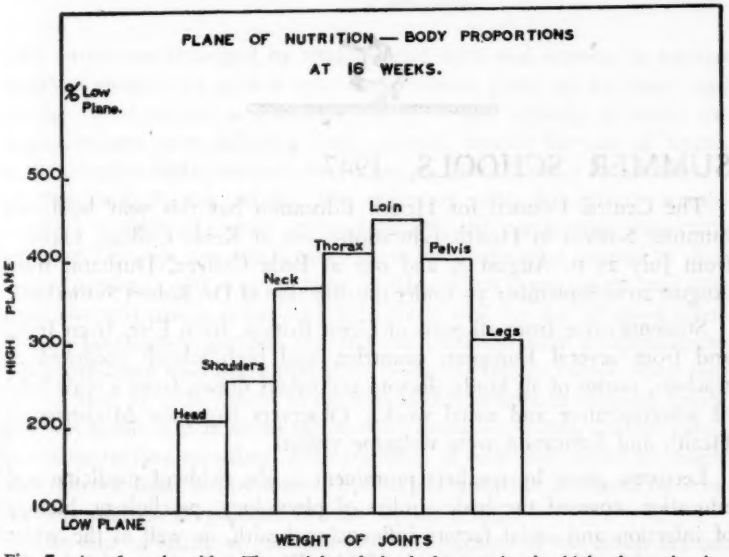

Fig. 7 At 16 weeks old. The weight of the body part in the high plane pigs is shown as a percentage of the weight of the body part in the low plane pigs.

life the skeletal and muscular framework is well developed and when these pigs are put on a reduced plane of nutrition these earlier developing parts continue to grow slowly but the development of the later maturing fat is inhibited and so a large-framed, muscular, but not fat, pig is produced (HL, Fig. 8). These two animals (LH and HL, Fig. 8) are of exactly the same body weight (200 lb.) and same age (196 days old) but, as will be seen from Fig. 4, have different shaped growth curves. It would appear that we can change the proportions and composition of the animal's body by the nutritional level on which we grow the young animal.

That such changes in form of the animal brought about by nutrition during the growth stages are not just of temporary duration but mould the form of the adult is shown by the fact that if at this stage (200 lb. live weight) both HL and LH pigs are put on the same nutritional level for the rest of their lives these differences still persist.

These experiments indicate that unless the potentialities for growth and development of the parts and organs which exist in high degree in the young animal are realised by making available to it an abundant supply of the proper foods, the full genetic capabilities of the animal will never be shown : or, put in another way, we have it in our power to shape the next generation by the creation of a suitable nutritional environment in which to rear it.

SUMMER SCHOOLS, 1947

The Central Council for Health Education has this year held two Summer Schools in Health Education—one at Keble College, Oxford, from July 25 to August 8, and one at Bede College, Durham, from August 20 to September 3—under the direction of Dr. Robert Sutherland.

Students came from all parts of Great Britain, from Eire, from India and from several European countries, and both schools consisted of teachers, nurses of all kinds, doctors and others drawn from a wide field of administrative and social work. Observers from the Ministries of Health and Education were welcome visitors.

Lectures, given by speakers prominent in the fields of medicine and education, covered the basic studies of physiology, psychology, biology of infection and social factors influencing health, as well as the wider aspects of health education in the field. Discussion groups, led by the students, were lively and well attended throughout.

Tuition in all types of physical recreation under expert leadership was much appreciated, while local expeditions, socials, dances, film demonstrations and book exhibitions all helped to make these two schools outstandingly successful.

SUMMER SCHOOL, 1948

The Central Council for Health Education is holding a Summer School in Health Education at High Leigh, Hoddesdon, Herts, from August 11 to 25, 1948. Those who are interested and would like further information are asked to write to the Medical Adviser and Secretary.

Places will be allotted in order of application.

The Central Council greatly regrets that present financial restrictions have compelled it to cancel the arrangements for the Summer School which it had proposed to hold in Sweden in 1948.

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PHYSICAL RECREATION AND PREVENTIVE MEDICINE

By J. A. Kerr Hunter, *Senior Technical Representative for Scotland, The Central Council of Physical Recreation.*

Our streets are thronged by middle aged men and women in various stages of decay: the athlete who has suddenly given up his sport, and having failed to find a substitute for it, is fast running to seed; the eager business man suffering from stomach trouble because of worry, who no longer finds time to fit in his golf or tennis because he has become so engrossed in his work; the ex-beauty who has given up the unequal struggle of figure versus appetite; the comfortable housewife who just does not care any longer; those who have been warned by their doctor to take it easy at some time or other when overwrought and who have accepted this as a life sentence; those who are full of good intentions, who mean to get into training but somehow keep postponing the day; and those who never give their bodies a thought except when they ache. Most of them believe in exercise as they believe in hygienic habits, but they think of it in terms of the daily dozen—a boring routine which too often neither stimulates nor exercises. If only they could be taught that exercise need not be formal and unpleasant, that it should be sheer enjoyment, then they would benefit beyond belief.

The daily dozen is a good habit if other forms of recreation are not available but it should not be allowed to take the place of play. Dogs, cats, and other active animals indulge in stretching and rolling exercises; but it is play, and free movements such as running and jumping, which keep them lithe and agile. Arm and leg wavings and body posturings are mere substitutes for natural movement and should only be used as such. I do not wish to belittle formal gymnastics. There is a very definite place for this exacting science in the scope of recreational activities in the same way as the ballet affords a physical and emotional outlet for a certain type of person, but the daily dozen must not be looked on as recreational. It is purely medicinal, a pill or draught taken to tone up sagging muscles.

Exercise should recreate the body, but recreation is not merely a matter of exercise. It should stimulate the mind as well as the body. It should raise the individual up and urge the muscles to greater exertions. No one can imagine this cycle of vigorous life being established by indulgence in a few exercises behind closed doors in the bathroom.

Play is the finest form of recreation. It is natural to all young animals

and the desire for play is strong in human beings. It might be described as the finest form of preventive medicine and should be the first prescription given by any doctor.

The term physical recreation covers a wide field of activity, with many pathways leading to the same goal. The choice of activity should rest with each individual but there are certain essentials which must be common. It does not matter whether it be rock-climbing, rugby, skating or golf which absorbs the interest of a person providing he finds in his sport the main ingredients of physical recreation: vigorous exercise, absorbing excitement, enjoyment and pride of personal achievement. The ingredients mixed properly are a wonderful prescription for healthy living.

It is not enough to play. One must play properly to derive the full recreational benefit from a game. Golf played slowly may satisfy pride of achievement and give enjoyment, but it will not provide the stimulus of excitement or the full pulsating throb of a striving heart, which is essential in the process of re-creating mind and muscle.

The Doctor and Physical Education

Physical education is now being taught in all schools throughout Britain; even to-day, however, with all the emphasis that is put on enjoyment by the leading experts, there is still a tendency to leave the young adult with a feeling of distaste for exercise, particularly when associated with the gymnasium. The physical training specialist can do much to put this matter right; but with the full backing of the medical profession a vast amount of time and energy could be saved. This would mean that doctors would have to study the work of the physical educationist as part of their training, but this would be a great help to them in their treatment of the sick and injured.

In this modern age of labour-saving devices when even our very clothes are designed to cover deficiencies of body and limb it is absolutely essential to have the support of the medical profession in this fight to improve the physique of the race. The doctor sees the true man and knows his failings, and his word is law in matters of health. Few would be brave enough to disobey him if he made it clear that an important way to renewed health and vigour is by the hard path of physical exercise.

During the war the medical officer learned to rely on his team of physiotherapists in restoring the wounded to health. To-day there is even a greater need for the doctor to work hand in hand with the physical training specialist: this team work, however, should be turned to the prevention of ill-health as well as to rehabilitation.

We are all working for the same end—a fitter, healthier Britain. Let us be of one company and work together.

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RECOGNISING DEPRESSION

By D. R. MacCalman, M.D.,
Crombie-Ross Professor of Mental Health, University of Aberdeen.

To be depressed is the most painful of all human experiences. Most people, at some time in their lives, have mourned the loss of someone they have loved, have known the bitterness of hope deferred, the despair of thwarted desires and ambitions, the misery of cold or hunger, illness or boredom ; or have been tortured by the knowledge of their own sins and shortcomings. These melancholic emotions come in response to some known event or circumstance, and the sufferer is seldom puzzled or alarmed by the strength of his feelings. His relatives and friends recognise the appropriateness of his reaction and are generally sympathetic and helpful. Tears and lamentations can soften the first shock of sorrow ; distraction can be found in employment and amusement ; while time brings healing and serenity.

Such an experience, generally referred to as *reactive depression*, may mature the individual and make him more sympathetic to those undergoing similar trials, but does not necessarily increase his understanding of those who are suffering from other forms of depression, in which the degree of depression is inappropriate to the circumstances—where it appears " out of the blue," as it were. This latter, and much more pathological symptom, is known as *endogenous depression*. Here we are dealing with deep unconscious mechanisms as yet imperfectly understood : they may be linked up with conflicts occurring during the early development of the individual, or with the primitive conflicts which beset our remote ancestors during the early development of the race. Or it may be that endogenous depression is the result of biochemical or endocrine imbalances, the nature of which is still a matter for speculation.

Which factor, or combination of factors, is responsible we do not know ; but it is probable that there is, in most cases, a combination of causes, physiological and psychological, inherited and acquired. So we must regard depression as a symptom, not a disease, for a ' disease ' has come conveniently to mean a symptom complex of specific and known underlying pathology.

The fact that reactive depression is a common experience has led the medical and nursing professions, as well as the general public, to deal unsympathetically, unwisely, and, at times, harshly with these unfortunate patients. They can sympathise with an outburst of tears, but they have little patience with weeping which goes on hour after hour and day after

day ; remembering the salutary effect of employment and distraction, they advise the patient, in scornful or angry tones, to " pull himself together " ; they begin to think him " weak willed " when he gets worse rather than better with the passage of time.

Further misjudgments occur because the kind of case shown to medical students or used to illustrate textbooks is the relatively uncommon " psychotic " type, with overwhelming depression, slowing of body and mind, self-destructive longings and nihilistic delusions. Like Mongolian idiocy such cases are not difficult to diagnose, and it is obvious that prompt treatment in a mental hospital should be advised. The less obviously depressed patient, attributing, as he does, his sufferings to some shortcoming or sin, is unwilling to talk about his feelings. He thinks that he deserves neither sympathy nor help, or he may fear the wrath or scorn which Job got from his ' comfortors.' Any unsympathetic treatment makes him more determined than ever to hide his feelings as best he can ; he struggles to continue with work he is unfit for, and ekes out a miserable existence until he recovers spontaneously, or, to the surprise of his friends, attempts suicide.

Other patients come to their doctor with a complaint of exhaustion, sleeplessness, headache, indigestion, constipation, and the like, and while they may be unwilling to mention their real troubles they devise a certain comfort from his presence or from the medicine he prescribes. Meantime, by circumlocution, they try to find out how he would react to a confession of their real symptoms, and it is a commentary upon the dearth of diagnostic skill that they are surprised rather than upset when such subjects as suicide are raised by the doctor. The frequency of the milder depressive states is, therefore, difficult to determine, but it is likely that for each patient so diagnosed there are many who suffer unaided and unsuspected. Watts* begins his admirable article with this refreshingly frank confession : " In six years of practice before the war I diagnosed only one case of endogenous depression, and that after the patient had committed suicide. After psychiatric experience in the Army I have found the condition comparatively common in general practice."

Despite the fact that a specific underlying pathology is not yet known, enough is understood of this condition to make early diagnosis possible. It is obvious that much unhappiness and inefficiency would be saved if the condition were recognised and given treatment at an earlier stage. Only by careful study of a greater number of patients showing depression in its early stages can we hope to advance our understanding of its causation and treatment, for successful therapy can only be based upon accurate appreciation of the underlying causes and specific pathology.

*Watts, C. A. H. (1947). *Brit. Med. J.*, **1**, 11.

Types of Depression

Certain types seem to be more prone to depression than others. The short, thickset, aggressive, extraverted person is often subject to marked swings of mood, which at times rise to heights of elation and even mania, or to depths of depression characterised by mental slowing, retardation of physical and mental activity, feelings of unworthiness, hypochondriasis, etc. Insomnia is almost invariable and often severe. This is the *manic-depressive* type of depression, and is the commonest form to be seen in mental hospitals. Recurrent attacks occur, and the onset may take place at any age after puberty, though not usually until the early twenties.

Persons who are unusually rigid, serious and self-driving, who are concerned about details, and prone to ruminate, have often an outlook on life which tends to be pessimistic. They are never quite sure of themselves, make only one or two friends on the chain principle, dropping one and then slowly picking up another, are often bachelors or spinsters, or have married lives which are limited in spontaneous affection and are often childless. These types seem to be predisposed to depression in the involutional period. This so-called *involutional depression* is characterised by much agitation and restlessness, and there are usually delusions of deprivation. The patient believes herself to have committed some cardinal and unforgiveable sin, to be penniless, or totally unable to eat or digest food. Constipation may be severe, and accompanied by the delusion of inner putrefaction. Death may occur from intercurrent infection or malnutrition, and suicide is a frequent termination when the patient is not treated promptly and adequately.

The over-anxious person with a lifelong history of " nervous breakdowns " associated with imbalance of the autonomic nervous system, shown by flushings, sweatings, palpitation, tachycardia, tremor, blueness and coldness of the extremities, frequency of micturition, and such conditions as asthma and migraine, may develop, particularly in later life, what has been called " neurotic depression," or more accurately an *anxiety state with depressive features*. These patients have spent their lives defending themselves against anxiety and bodily unrest which has its origin in deeply hidden frustration and feelings of guilt. This anxiety may at times become so acute that the patient unconsciously seeks relief in the numbing effect of depression. In other cases the depressive features are variations of response to the same underlying forces which produce the anxiety. Depression of this type is seldom severe or of great duration, but the suffering is very acute, because the patient almost invariably develops fears of becoming insane or of commiting suicide. Here we should note that thoughts of suicide may occur even in mild degrees of depression. The severely depressed patient seldom talks spontaneously

of these ideas, and is rarely afraid of them ; indeed, a marked lightening of spirit, leading the inexperienced to think that the patient has recovered, often takes place in the depressed patient who has made up his mind to end his life. The neurotic depressive voluntarily expresses his fear of self-destruction but seldom carries it out. Another distinguishing feature of this type of depression is that the patient finds it difficult to get to sleep owing to his troubled and overactive thoughts, while the patient who is more severely depressed goes to sleep fairly readily and wakes up after a few hours.

The thin, attenuated, asthenic person, who has throughout life shown a greater interest in the inner than the outer world of reality, can develop a further type of depression. Often physically awkward and timid, delicate and weak, he has no time for or interest in robust pursuits ; he makes few friends ; is often a book-worm or a collector, and interested in art and music. He is unusually sensitive to the opinions of others, feels that nobody understands him, and makes no approaches to remedy his loneliness. Given to daydreaming, in which he sees himself a hero, he compensates in thought for this failure in real life. While yearning for all the good things of life, especially good relationships with others, he is incapable of taking the most rudimentary steps to attain his desires. Because his high standards and low attainments persist without change throughout life, from time to time he is overcome with a sense of utter futility and meaninglessness which might to the unwary appear to be depression, but should be in fact distinguished from it. As the patient's personality closely resembles that of the schizophrenic person the term *schizoid depression* has been coined.

Differential Diagnosis

Having noted how varied are the initial complaints which depressed patients make to their doctors, it should be remembered that almost any functional or organic disease may be simulated by endogenous depression. Organic disease can easily be excluded to the doctor's satisfaction, but if the patient remains unconvinced, the presence of depression should be suspected. Obsessions or hypochondriacal phobias may cloak an underlying depression and deceive both the patient and his doctor. This is seen in the woman who develops an intense preoccupation and self-consciousness about hair on her face, which has existed almost unnoticed by her for many years. More frequent are obsessions about venereal disease ; the patient derives no comfort in negative serological tests, talks with embarrassing frankness about his sex-life to anyone who will listen, and bewails his sinfulness. Such obsessions are aggravated by psychotherapy, and it is only when the underlying depression is treated that his

obsessions disappear. Even more common are the intense preoccupations with the lower bowel shown by elderly male patients. All depressed patients are self-centred, but these old men focus their attention to the exclusion of all else upon the excretory performance of their intestines. "It's my bowels, doctor!" they continuously cry, until it is difficult to tell whether their own or their audience's distress is the greater. Both at least find relief when the causative depression is successfully treated.

Having admitted that a patient can be so depressed that his physician experiences a reflected melancholy, we must use this phenomenon in differentiating endogenous depression from states of anxiety. The true depressive surrounds himself with such an aura of melancholy that the physician experiences a sort of despair of being able to help him. His intuitive feelings are accurate to the extent, at least, that the depressive allows reassurance to pass him by, even though he never seems to tire of it. He himself is content to repeat the same description of his feelings endlessly, and shows little intellectual interest in rational therapy. The neurotic, on the other hand, would not tolerate such a stereotyped procedure, and generally shows such obvious enjoyment in tracing the subtle interplay of cause and effect in his past experiences, that his physician may be stimulated rather than cast down by the interview. Experience in handling a number of endogenous depressions, therefore, allows the physician to use his own feelings as an aid to differential diagnosis.

Conclusions

What we have tried to emphasise in this short article is that depression is a terrible scourge, exquisitely painful and dangerous to the life of the patient, and distressing to all who know him. Despite the fact that the true cause and nature of this trouble is still a mystery, much can be done by modern methods of treatment to relieve suffering and shorten the duration of the attack. Early recognition by relatives, friends, social workers, nurses and doctors is essential, but greatly increased facilities for expert treatment should be demanded. These patients cannot be classified heedlessly with the insane, for few could be certified, and the great majority resist any suggestion of voluntary treatment in a mental hospital.

Most of them could be successfully treated in a general hospital, provided that an adequate psychiatric department was available. It is unfair to add the undoubted, though unfortunate, stigma of mental hospital to their existing distress, and surely they are more worthy of consideration than venereal patients who are given expert and confidential treatment in almost every general hospital in the country.

Hlth. Educ. J., 1947, 5, 174—177

CONTROL OF INFECTIOUS DISEASES

By Robert Cruickshank, M.D., F.R.C.P., D.P.H., *Director Central Public Health Laboratory, Colindale.*

One hundred years ago, measles killed ten thousand children every year. In 1945, only 700 deaths were reported from this disease. This rapid decline in mortality applies to nearly all the infectious diseases. But the problem still remains one of great magnitude, for one death in five can be traced directly or remotely to infection. Control of the infectious disease is a complex affair requiring the co-operation of every doctor and indeed of every responsible citizen, for control means not only a concerted attack on sources and means of spread of the infection itself in order to prevent or lessen its occurrence, but it also implies the care and cure of the infected persons, which may mean removal to hospital where the skill of nurses and doctors restores the patient to health and saves lives among those who are seriously ill. In a broad sense, then, control includes all measures which decrease damage, whether physical, enonomic, social or psychological, to the human host as a result of infection : and with no marker to indicate where preventive medicine leaves off and good curative medicine begins. The measures which have been introduced in this country have been aimed to do just that, and to-day, with great improvements in nutrition and environmental hygiene, and with the help of new drugs, many infections which formerly caused alarm and fear have been banished or have ceased to worry us.

How Legislation Began

First let us retrace some of the steps that have been taken to control infectious diseases during the past century. With industrial development and the rapid rise in population early in the nineteenth century there was a corresponding development of new towns and expansion of existing ones. New houses were built in the cheapest possible way without any of the sanitary conveniences which we now expect, and each house was crammed from cellar to attic by poorly paid men with large families. Arrangements for the removal of refuse and night soil were most crude and inadequate so that streets were deep in mire and courtyards were used as dunghills. Outbreaks of cholera and typhus swept through whole towns and every autumn typhoid fever took a heavy toll of life. It was on such a scene that there happened a young lawyer, Edwin Chadwick, who became our first great sanitary reformer and whose disclosures on the wretched conditions in our cities initiated the first real steps in the

control of infectious disease. For Chadwick was so impressed by the association of filth and disease that he advocated against great opposition, and with the help of like-minded men introduced, the water carriage system for the disposal of sewage, the purification of water supplies and the cleansing of streets. Within a few decades cholera had disappeared from the land, typhus and plague became rare visitors, and typhoid ceased to be a prevalent fever. Although proof that these diseases were spread by living agents had to wait until Pasteur's time, Chadwick's "Sanitary idea" as he called it, took root and was developed by Simon, the first Medical Officer of Health of the City of London, and later adviser to the Privy Council. By his efforts there was passed the Sanitary Act of 1866 which enabled local corporations to isolate infectious diseases, disinfect houses, provide hospital accommodation, and to deal with overcrowding in dwelling houses and insanitary conditions in workshops. These powers were consolidated and amplified in the great Public Health Act of 1875, and in 1899 a comprehensive list of infectious diseases was made compulsorily notifiable. To-day the Local Authority through its Medical Officer of Health, and with the support of the Ministry of Health, has comprehensive powers for "the treatment of patients affected with any epidemic, endemic or infectious disease and for preventing the spread of such diseases."

Present-day Requirements

Briefly, these measures are that the head of the house or the family doctor must at once notify the Medical Officer of Health of any person in a household who is suffering from an infectious disease, and a certificate of infection, for which a fee is paid, must be sent by the practitioner to the Medical Officer of Health. The patient may then be removed to an infectious diseases hospital, or, if home conditions permit, nursed in isolation at home. Family contacts may be debarred from work or school and disinfection of the sickroom and all bedding and personal clothing may be carried out. Usually the infectious diseases hospital is quite separate from general or other special hospitals and is administered by a Medical Superintendent who is a specialist in infectious diseases, with nurses specially trained in the technique of nursing fevers. Modern isolation hospitals in our large towns are liberally supplied with single rooms and small wardlets for the isolation of infants and other patients who require separate nursing, and are well equipped with X-rays, surgical theatres and other ancillary aids to accurate diagnosis and up-to-date treatment. Besides the notification and isolation of affected cases it is an offence to allow any person known to be suffering from an infectious disease to expose other persons to risk by his presence in street or public

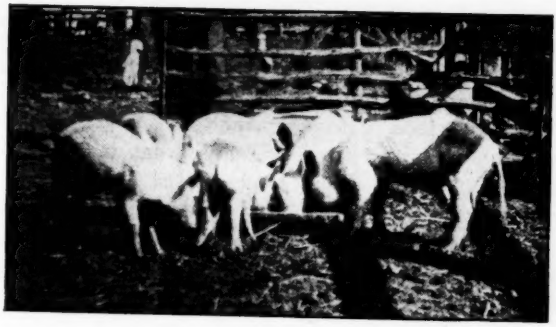
place, or to enter a public conveyance or to engage in work which may involve the risk of spread of infection. Another preventive measure is the prohibition of any known carrier of typhoid germs from engaging in a business where food or drink is handled.

In order to tell what is the incidence of any infectious disease in his own area or in the whole country, the Medical Officer of Health compiles and sends a weekly return of all notified infections to the General Register Office where a statistical staff associated with the Ministry of Health sorts the information and issues weekly as well as quarterly and yearly records of the total notifications and deaths from infectious diseases in the country. This information correlated with the estimated population in his area (all births and deaths being registered) enables the Medical Officer of Health to watch carefully the trend of any infectious disease locally or generally and to take such preventive measures as he thinks fit.

Immunisation and Chemotherapy

While the practice of notification, isolation and quarantine has saved many lives by ensuring proper nursing and medical care of sick patients, it is dubious if by itself it has materially reduced the incidence of infectious disease. The water carriage system of sewage disposal and the purification of water and milk supplies have been the most important factors in controlling the enteric diseases. By contrast, the orthodox measures of notification and isolation have made no great impression on the incidence of respiratory infections such as scarlet fever and measles. It is true that deaths from these infections have shown remarkable reductions, but this lower mortality is related more to better nutrition and improved environment than to the statutory preventive measures. We have brought under control only those respiratory infections against which there has been developed effective immunisation. Thus, smallpox has ceased to mutilate our children, and diphtheria, with more than one-half of the child population immunised during the war years, has been reduced to less than one-half of its former incidence, while deaths are now only a quarter of those in pre-war years.

In the more serious infections like pneumonia, cerebrospinal meningitis and child-bed fever, against which immunisation is impracticable, the new chemotherapeutic drugs, sulphonamide and penicillin, have saved many lives. Thus, the largest epidemic of cerebrospinal meningitis in this country, with upwards of 40,000 notified cases, occurred during the early years of the 1939–45 war. Before the introduction of the sulpha drugs, the fatality rate from cerebrospinal meningitis was around 60 per cent ; to-day it is less than 20 per cent, so that there has been an estimated saving of some 16,000 lives during the years 1940–44. A



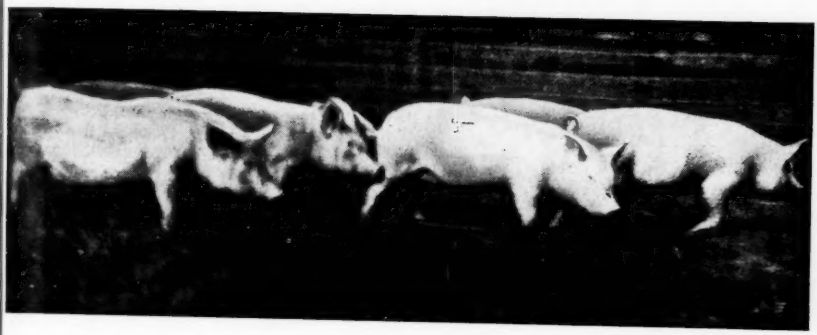


FIG. 5.—At 16 weeks old. Low plane pigs (above) and high plane pigs (below): both reduced to the same scale.

(*See page* 164)

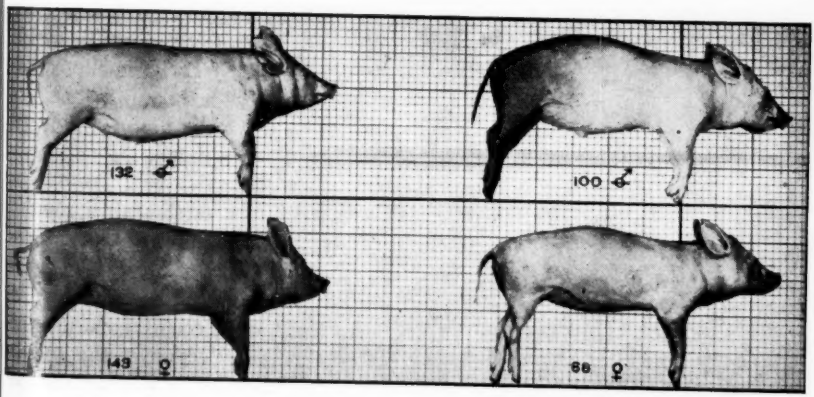


FIG. 6.—At 16 weeks old. High plane pigs (left) and low plane pigs (right): reduced to the same shoulder height in order to show differences in body proportions.

(*See page* 164)

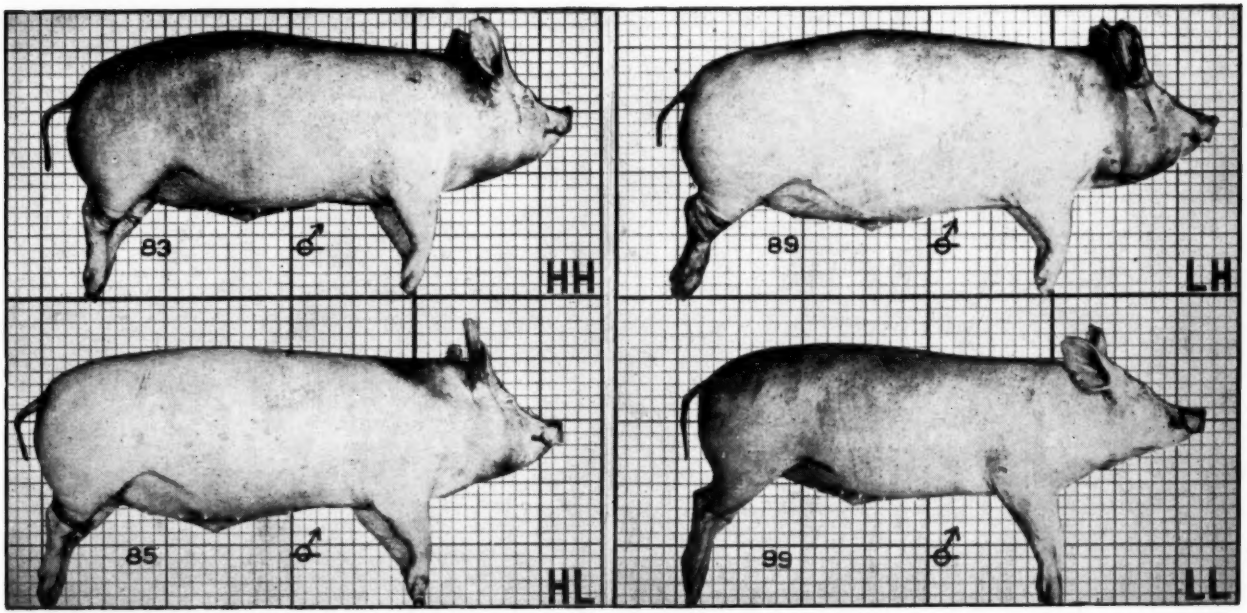


FIG. 8.—At 200 lb. body weight. *83 H.H.*—Quickly grown throughout: 168 days old. *85 H.L.*—Quickly grown to 16th week: afterwards grown slowly: 196 days old. *89 L.H.*—Slowly grown to 16th week: afterwards grown quickly: 196 days old. *99 L.L.*—Slowly grown throughout: 315 days old.

(*See page* 164)

(See page 164)

similar tale could be told of lobar pneumonia which has its greatest incidence among male wage-earners, or for child-bed fever which used to carry off three out of every thousand mothers, but to-day kills only three out of every ten thousand.

The Latest Development

Control of infectious diseases is assisted by the early and accurate diagnosis of individual cases, which allows early isolation of the patient and so protects intimate contacts from exposure and facilitates good treatment. Often the doctor cannot make an early diagnosis of diphtheria or typhoid or tuberculosis from the clinical signs and symptoms alone, and he calls in the help of the laboratory. A good laboratory service is therefore essential in the control of infectious diseases and has not hitherto been generally available in Britain. However, during the war the skeleton of such a service, called the Emergency Public Health Laboratory Service, was established by the Medical Research Council acting for the Ministry of Health. It did much good work both in helping the practitioner with the diagnosis of infectious diseases and in co-operating with the Medical Officer of Health in field work such as immunisation against diphtheria, investigation and control of outbreaks, and the collection of valuable epidemiological data. This Public Health Laboratory Service will become a national service under the new Health Act and will doubtless play an important role in the further control of infectious diseases.

A second article by Dr. Cruickshank will appear in our next issue.

INDEX TO VOLUME V

The Editor regrets that owing to paper restrictions it has not been possible to provide with this issue the title page and index to Vol. V of the HEALTH EDUCATION JOURNAL. A small quantity of the indices are available, however, and can be supplied free of charge on request.

BINDING

Arrangements can be made for binding Volume V at an inclusive cost of 5s. 6d. Copies of the Journal for binding should be sent to the Editor, Health Education Journal, Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1, with a cheque or postal order for the amount.

Slowly grown throughout: 315 days old.

Hlth. Educ. J., 1947, 5, 178—181

MILK AND HEALTH

By Mary B. Horton, M.A.,
Director, Sealtest Consumer Service, New York.

Everyone wants to be healthy. We want to enjoy living to the utmost and we want to live to a ripe old age. Despite these strong urges, too many persons are indifferent, or are unwilling to do much to attain these objectives. A long time ago a famed Greek philosopher said "We are what we eat"—a statement just as true today as it was then. Only today we have facts to support the statement; and as research progressively unfolds the secrets of health and life, the more convincing does it become. Yet we persist in living on a diet that eventually decreases physical vigour and lessens our chance of living a long useful life.

The Importance of Protein

For years it has been known that milk is the most nearly perfect food and that it alone will supply more of the essential food nutrients than any other single food. Every constituent in milk serves a useful purpose in the body. Let us consider for a moment some of the nutrients found in milk. Milk contains protein, which is absolutely essential to life. As yet, nothing has been discovered that will replace protein in the diet, and so it is essential that some protein foods be consumed daily. Among the foods furnishing large amounts of protein are milk, cheese, eggs, meat, fish and poultry.

When proteins are digested, they are broken down into simpler substances called amino acids—often referred to as building blocks because they are used by our body cells for the building and rebuilding of body tissue. Some amino acids can be made in the body. Others must be provided in the diet: these are called essential amino acids. Proteins are classified according to the amino acids they contain. If they provide all the essential amino acids, they are designated *complete* proteins; while they are called *incomplete* if they do not contain all the essential amino acids. The proteins found in milk, chief of which are casein and albumin, contain all the essential amino acids, and so are complete proteins.

Oatmeal and other cereals are good examples of partially incomplete proteins that may be greatly improved nutritionally by supplementing them with a complete protein, such as milk. That is why oatmeal and milk make such a nourishing combination. A cereal diet, which in itself is likely to be deficient in protein is enhanced by the simple addition of milk.

Extensive investigations have clearly demonstrated that every cell of the body needs protein and needs it daily. When protein is lacking or is insufficient, people become tired and listless. This is especially true of children whose rapidly growing bodies need protein to meet their demands. In 1926, Dr. H. Corry Mann conducted an interesting study in England among healthy students in an industrial school in which milk was added to diets considered adequate. During the four years of this experiment, students receiving the extra milk averaged each year an increase in height of 2.63 inches, while those on the diet without the additional milk increased only 1.84 inches. In commenting on this study, Sir Walter M. Fletcher of the British Medical Research Council, stated that on a dietary " adjudged to be sufficient for healthy development, the boys were in fact not attaining to the physical and mental growth of which they had the potentiality, and to which they did attain, when given an extra daily ration of milk." Similar experiments carried out in Scotland and other parts of the world gave similar results. In the diets of school children assumed to be adequate, the addition of milk brought marked improvement in physical appearance and in physical and mental performances.

Other Valuable Nutrients

Milk sugar or lactose is another important food nutrient. In the intestinal tract, lactose helps to check the development of undesirable bacteria and to stimulate the growth of desirable bacteria, contributing to the control of intestinal ailments and to healthy functioning. Moreover, recent studies have indicated that lactose aids the body in utilising calcium for the development of strong skeletal structure. This may explain why the greatest milk drinkers in the world are usually the people of greatest physical stature. For years scientists have known that the Sikhs of northern India, who drank milk and included milk products in their diet, were finer specimens of humanity than the Madrassi of southern India who used little milk. The same striking differences were found in Africa and other parts of the world—all pointing to the importance of milk in the diet.

Another contribution of milk to health comes from its mineral content. Many different kinds of minerals are present in milk and each serves an important and useful purpose. The most important minerals are calcium and phosphorus, both essential for the development and maintenance of bones and teeth. In the growing child, the indispensability of milk as a source of calcium has been clearly demonstrated, and the American recommendation of a quart of milk daily for every growing child is based on this need. No other food in the diet can replace milk as a source of calcium. Phosphorus is less likely to be deficient in the diet

than calcium because of its presence in many foods, yet the amount obtained by a liberal intake of milk is significant.

In a minor role, magnesium too, serves the same purpose as calcium and phosphorus, including utilisation in certain body fluids. The salts of chlorine furnish material for certain digestive juices, while potassium and sodium aid in preserving the alkalinity of body fluids. Sulphur, of which milk usually contains only a trace, is useful ; and even the relatively small amount of iron found in milk is important because of the high degree of its utilisation by the body and its part in the building of blood.

Even whey, the liquid portion of milk, is important. Whey, besides increasing the palatability of milk, serves as a supporting agent for the other milk constituents. In the body it acts as a regulator of body temperature and an eliminator of body waste.

The butterfat in milk supplies the body with warmth and energy and contains nutritionally-essential fatty acids. Butterfat is more readily digested than the fat of most foods because it is in an already emulsified form. It is of interest that some Orientals greased their skins with butterfat for its antiseptic properties. We know today that certain volatile fatty acids derived from milk have antiseptic properties and it may be that these have significance in healthy intestinal functioning.

The Vitamins in Milk

We cannot extol the value of milk without mentioning another group of its prominent constituents—the vitamins. How essential these are to general health and vitality is common knowledge to all. That they are found abundantly in milk is not so well recognised as it deserves to be, for milk is an excellent source of these health essentials.

Vitamin A, necessary to the maintenance of healthy tissues, resistance to infection and good eye health, is found in significant amounts in milk. Of the B group, two are contained in milk in substantial quantity—thiamine and riboflavin. Thiamine is needed to build-up a stable nervous system and to promote good appetite and digestion, while riboflavin is needed for growth, good eyesight and healthy skin. A third member of the B group, niacin, is also found in milk, but in smaller amounts. This vitamin aids in digestion and endurance.

In America, a substantial volume of the milk consumed is fortified with vitamin D, which is needed for the proper utilisation of calcium: since milk is our best source of calcium, the addition of vitamin D greatly enhances its nutritional qualities.

Milk contains only a little vitamin C which unfortunately is reduced by pasteurisation. However, the vitamin C in milk, small in amount though it is, may be of more significance nutritionally than is commonly thought. Nevertheless, the safeguard of pasteurisation should

be universally applied. Raw milk is as outmoded as the horse and buggy and has no place in our modern dietary.

Health is not a matter of luck. Buoyant health and vitality are synonomous, for we cannot separate one from the other. Good health means an abundance of healthful vigour and this depends to a marked degree on good food habits. So we have it in our power to advance our own physical and mental well-being by giving thought to our eating.

BIOGRAPHICAL NOTES

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ROBERT CRUICKSHANK, M.D., F.R.C.P., D.P.H.—Director of Central Laboratory of the Public Health Laboratory Service which is organised and directed by the Medical Research Council for the Ministry of Health; extra-mural teacher at London School of Hygiene; formerly Pathologist in charge of an L.C.C. Group Laboratory; Lecturer in Bacteriology, University of Glasgow; Bacteriologist, Glasgow Royal Infirmary; research work has included investigations in scarlet fever and other streptococcal infections, pneumonia, diphtheria, whooping cough, intestinal infections, puerperal sepsis, hospital and air-borne infection; Joint Editor of *Control of Common Fevers* and Sectional Editor of *Recent Advances in Clinical Pathology*.

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Hlth. Educ. J., 1947, 5, 182—184

HEALTH EDUCATION IN THE WELFARE CENTRE

By M. Slack, S.R.N., S.C.M.,
Tutor to Health Visitor Students, Birmingham.

The health visitor is a key worker in the field of preventive medicine; and as preventive medicine is more and more seeking the co-operation of the individual and the citizen, she must in future increasingly develop her ability to teach, in the home, in the maternity and child welfare centre and in a wider field.

The maternity and child welfare centre in particular offers many and varied opportunities for health teaching, which can be organised in relation to the specific interests of such routine sessions as ante-natal clinics, post-natal clinics, infants' and toddlers' clinics; special sessions like ultra-violet ray clinics, remedial exercise clinics and dental clinics; and *ad hoc* educational sessions for mothercraft instruction and parents' meetings.

The health visitor's task is to inspire a desire for positive good health and to promote a sense of responsibility for one's own health and the health of the community. To achieve these aims she must try to see that each individual has a working knowledge of how the body functions, a knowledge of how disease is transmitted and its spread prevented, and of parentcraft.

If the health visitor is to carry out these wider duties successfully and with acceptance, however, she in turn must have certain qualities: a love of teaching; an interest in people as individuals; the desire to interest others in healthy living; a wide and varied knowledge of conditions which produce ill health (physical, social, environmental and financial), and more important still, the ability to use this knowledge to prevent ill health and maintain positive good health; the ability to think and live healthily herself; the ability to present material in such a way that the interest of each individual member of the audience is aroused.

Extending the Range of Interest

The health education field is so wide, however, that no one individual can possibly cover it adequately by herself. The health visitor must, therefore, seek outside help.

Expert advice on cooking is welcomed by many mothers, and so domestic science teachers or demonstrators from the Food Advice Service of the Ministry of Food should be called in to assist the housewife to make the best use of her rations. Cooking or laundry demonstrations are very popular in maternity and child welfare centres.

Young mothers who are interested in keeping their bodies in good condition welcome instruction from the remedial gymnast or the physical training demonstrator on how to keep fit.

Increasing interest in the child's normal mental development and in the management of the difficulties which may arise during the early years of childhood is shown by both parents. Few health visitors feel competent to give teaching of this type ; but the Central Council for Health Education and the National Association for Mental Health are always sympathetic towards requests for speakers.

When parents' meetings are held as part of the activities of the centre, the Central Council for Health Education and the Marriage Guidance Council staff are prepared to assist in teaching relating to married life ; and lectures of this type are valuable additions to the activities already mentioned.

A Comprehensive Plan

Maternity and child welfare centres are usually open throughout the year and it is helpful to plan a programme of educational activities to cover the entire year. When possible, it is desirable to use a small room situated away from the main distractions of the centre. In this room it is possible to prepare demonstrations and blackboard notes ready for use at the different sessions. In this way much time and labour can be saved. The teaching can be divided as follows :

Routine Teaching

This would consist of short ten-minute talks given at intervals during each clinic session. A syllabus is helpful here as it is possible to plan ahead and, for example, arrange to give a talk on the "Common Cold" before such colds become prevalent or a talk on "How to protect a baby from undue exposure from the sun" early in the year. Where possible blackboard notes, attractive posters or demonstrations should be used in conjunction with the actual speaking. An attractively prepared poster with carefully selected wording arouses the listeners' interest and is often remembered for longer than the actual subject matter of the talk.

Special Classes

Classes on mothercraft, sewing, cooking, laundry, etc., occupy a longer time and each session should be carefully planned so that interest is maintained during the entire period. Many members of the audience may be unaccustomed to listening even for short periods and learn best when combining the visual and audile senses. It is often a good plan to divide the time into shorter periods, for example, an introduction—which would include revising the material given in the previous session (ten to twenty minutes) ; a demonstration—linked with actual subject matter (fifteen to twenty minutes) ; a summary (ten minutes) and questions. When possible the members of the audience should be allowed to take an active part, probably in helping to

prepare a layette for teaching purposes or actually preparing a tray for a sick child.

Parents' Groups

Usually these are held in the evening at monthly or quarterly intervals. The parents are often willing and anxious to assist in organising such activities. A small committee of parents can be formed and will often prepare a programme of social and educational activities and will also be responsible for engaging speakers, arranging for refreshments and conducting the meetings.

Literature, Films, etc.

Literature should be available and used to supplement the teaching. Pamphlets should be attractively prepared and the information supplied should be up to date. The magazine *Better Health* and much interesting literature can be obtained from the Central Council for Health Education for distribution in the centres.

A small library is appreciated by the parents and the books should be chosen carefully to supplement the teaching which is given in the centre.

Films should be used as widely as possible. Many good films suitable for showing to parents have been produced by the Central Council for Health Education and by the Central Office of Information. These can be obtained through the local branch of the Central Office of Information. The new film strip apparatus which was used widely during the war for educational purposes for the Forces can now be obtained in this country. The advantages of this apparatus are that it is relatively inexpensive; it is easy to use (a simple attachment fitting into an ordinary electric light fitting or power plug is all that is required); it is small and easy to carry about and is about the size of an ordinary attaché case; if a speaker wishes to discuss one particular picture, it is possible to control the apparatus for an indefinite time; and film strips can be made according to the lecturer's requirements.

Teaching through the medium of carefully prepared posters should be extended. These must be changed frequently and can be used in and outside the maternity and child welfare centres.

A Great Opportunity

Here then is the outline of a plan for health teaching in maternity and child welfare centres. Each health visitor will recognize, however, the special needs, opportunities and difficulties in her own centre, and will reshape this plan and develop it in accordance with these. But whether her plan is ambitious or modest, the health visitor has here a great opportunity for developing, in co-operation with the medical officers attending the centre, a comprehensive scheme of systematic instruction which will bring to the mothers and children attending the centre the health knowledge and the health attitudes that they must have if they are to be helped to reach as high a level of health and happiness as their existing physical and social conditions will allow.

Hlth. Educ. J., 1947, 5, 185—189

INDIVIDUAL AND HERD IMMUNITY

By Maurice Mitman, M.D., F.R.C.P., D.P.H., *Medical Superintendent, Joyce Green River Hospitals, Dartford.*

Infectious diseases are due to invasion of the body by germs whose object is not to cause disease and death to the host, but to find facilities for living and multiplying themselves. Since pathogenic germs usually require living tissue on which to grow it is to their disadvantage to kill their host ; if as the result of their invasion the host dies, they usually die with him. From the germ's point of view, the most satisfactory arrangement is a state of parasitism in which the germs receive their sustenance without harming the host—indeed, sometimes helping the host's economy. Although knowledge of their contribution to the working of the normal, healthy body is a relatively recent discovery, such organisms do exist in the intestine and this discovery has a bearing on the use of the marvellous new drugs, the sulphonamides and penicillin. These owe their great value to their ability to kill germs in the body without injury to the body. But sulphonamides, and to a much less extent penicillin, occasionally cause side-effects of an unpleasant character. For example, when given by mouth to destroy pathogenic germs they may give rise to a deficiency of vitamin B. It is now known that this side effect is due to destruction of intestinal symbionts i.e. organisms normally resident in the bowel which far from causing disease, help the body by elaborating vitamins of the B complex.

(In parenthesis I want to dissociate myself from the view that we must not upset the balance of nature, as if Nature, with a capitial N, were a benevolent old lady who, with judicial wisdom, balances the needs of the world carefully and whose judgment we defy at our peril. " Nature in the raw is seldom mild " says the tobacco advertisement and nothing is truer. Indeed our very existence depends upon our ability to interfere with nature.)

Temporary Immunity

Although there are other instances where infection with germs is actually helpful, in general the word " infection " is not used for this form of parasitism, but is reserved for the type of invasion which damages the body, and against which the body wages war, using in the process an elaborate defence system. The resistance which the body puts up to infection depends upon the various forms of immunity with which it is

born or which it acquires. Sometimes we " interfere with nature " by inducing immunity artificially as in the various forms of inoculation and vaccination against disease. The temporary immunity with which many infants are born depends to a considerable extent on the passage of protective substances or antibodies (a bad word) from the mother to the infant through the placenta—that fleshy link between mother and child called the afterbirth because it is expelled after the birth of the child. It is of interest to note that placental extracts have been used to induce artificial immunity against diseases like measles. In some animals, but to a negligible extent in humans, antibodies are provided for the infant in the mother's milk. For reasons which are not yet clear there is an increased production of antibodies during pregnancy, and—probably on inadequate grounds—pregnant women have been said to be more resistant to such diseases as poliomyelitis. On the other hand, some infections, such as smallpox, are believed to assume graver forms in pregnancy.

When infection of the pregnant mother does occur, the effects on her unborn child may be grave. The fœtus may be killed or the child may be born with the disease. Sometimes the child escapes entirely, but, if the infection takes place early in pregnancy and is not severe enough to kill the fœtus, it may, nevertheless, gravely influence the development of the child. Australian workers have made the momentous discovery that mothers infected early in pregnancy with rubella (German measles)—a mild disease—may give birth to infants with such terrible congenital defects as blindness, deaf-mutism, heart disease and mental deficiency. This has altered the whole outlook on the causation of these congenital defects, many of which were formerly regarded as hereditary. It has also impressed on us the importance of protection of the pregnant mother against infection. Indeed, contrary to the usual advice—which is to avoid infectious disease early in life because of the greater fatality—it has even been suggested that children should be deliberately exposed to rubella, so as to get it over and acquire lasting immunity. A still graver suggestion has been made—that if a pregnant woman acquires rubella in early pregnancy an abortion should be induced to prevent the birth of congenitally defective children. A human blood serum has also been obtained from persons convalescent from rubella ; it contains antibodies to the virus which causes rubella, and if the serum is injected into a woman known to have been exposed to the disease it may protect her from an attack. This form of protection by the injection of antibodies in a serum is known as passive immunity. In contrast to the active immunity (such as diphtheria immunisation about which I am going to speak) it is of very short duration, lasting only about two or three weeks. An advance in passive immunisation has been the separation from the blood serum of globulins —organic chemical substances to which the antibodies are commonly

attached. They provide safer and more powerful protection against such diseases as measles.

Permanent Immunity

Now for the more permanent forms of immunity. Most of the acute infectious diseases are children's ailments. With age an immunity is acquired which is partly due to age itself, partly to the small subclinical or inapparent infections to which all urban populations are exposed, and partly to the immunity which follows an attack of the disease.

It is the knowledge that small exposures result in inapparent infections and augment immunity which is the basis of the various forms of artificial immunisation now practised. Perhaps the two most outstanding examples are vaccination against smallpox and immunisation against diphtheria. Although active immunity is durable, we now recognise that it wanes and requires to be boosted more frequently than was formerly supposed. In diphtheria immunisation for example, the best time to begin immunising is in the second six months of life; two injections are necessary. Thereafter boosting or re-inforcing injections should be given at times when the child is subjected to new communal contacts, because at such times there is increased exposure to infection. Boosting doses should be given at 2–3 years of age, at 5 years of age (just before joining school), at 8–14 years of age and at any other time of marked prevalence or close contact with the disease.

When diphtheria immunisation is on a sufficiently large scale the disease can be practically eliminated from a community. The following figures given in the report of the Chief Medical Officer of the Ministry of Health for the six war years refer to the City of New York, where immunisation has been more extensively practised than here.

Year	*No. of cases notified*	*No. of deaths*	*Death rate per 100,000 children living under 15 years old*
1910–19 (average) (before Park and Zingher's campaign)	14,282	1,290	83
1920–29 (average) (during Park and Zingher's campaign)	10,685	684	42
Official campaign 1930 ...	3,798	198	11.7
„ 1935 ...	1,189	68	4.0
„ 1940 ...	386	10	0.7
„ 1944 ...	243	6	0.4

The percentage of children under 15 in New York City who are now

immunised is 65–70 per cent. Such a figure is usually enough to eliminate diphtheria from a community provided the pre-school child is included in the scheme.

In England and Wales the national campaign, as distinct from the local campaigns, began in 1940. By 1945 about half the susceptible population was immunised. Notifications fell to 25,246 and the deaths to 722, representing a decline of as much as 20 per cent in one year. (For 1946 the deaths were only 472—the lowest to date.) But on the Continent where immunisation received a setback during the Nazi régime, diphtheria has been a serious post-war disease in both young and adults.

Herd Immunity

This raises the question of herd resistance (as distinct from individual resistance) and of the factors influencing the spread of disease. The first factor is, of course, the immunities of the individuals comprising the group. But herd immunity is not merely the summation of the immunities of the individuals ; for example, a group of children in a playing field exhibit a different herd resistance from the same group in a badly overcrowded transport vehicle ; again, two separate groups exhibiting the same quantitative individual immunity but living under different social conditions have different herd immunities.

For an infectious disease to spread, an epidemic variant of the organism must become prevalent, and the density of susceptible persons in the population must exceed a threshold value. This value is altered by environmental conditions such as poverty and overcrowding. Contrary to popular belief, nutrition does not influence individual immunity : it appears, however, to be related to herd immunity, probably because it is associated with such factors as overcrowding, inadequate medical attention and other social hardships associated with poverty, which allow infectious diseases to spread.

The complexity of the problem of the control of infectious disease can be illustrated from diphtheria and scarlet fever. Since the beginning of the century there has been an enormous decline in the number of deaths from both these diseases ; but for different reasons. In the case of scarlet fever there has been little change in the incidence of the disease and the fall in mortality was due to a fall in case fatality, i.e. among those affected the disease is not so fatal as it used to be. The chief, but not only, factor responsible for this was a decline in the virulence of the causative germ. On the other hand the fall in mortality from diphtheria was due to a decline in both case fatality and incidence. Case fatality was lowered by earlier diagnosis and better treatment with antitoxins. Incidence was lowered at first by improved social conditions, but later the fall received

an enormous impetus from active immunisation which wiped the disease out of some North American cities.

It may be seen then that in our attempt to control infectious diseases, we must try to raise individual and herd immunity. In both cases health education has an important part to play. It can help to raise individual immunity by spreading knowledge of the diseases against which some protection can be offered and the facilities which exist for providing that protection. In the case of herd immunity it can help by drawing attention to environmental factors and customs that favour the spread of infection.

NEWS FROM THE FIELD

Mothercraft at School

THE Education Authority and the Health Department of the County Borough of Darlington have recently started a scheme for systematic instruction in mothercraft in Girls' Secondary Schools.

The instruction is given by health visitors in five two-hour classes each week. The syllabus is based on the "Regulations and Syllabus for the Teaching of Mothercraft" issued by the National Association of Maternity and Child Welfare Centres and is both practical and theoretical. Each school provides its own demonstration material.

When more staff becomes available, health instruction in schools will be extended to boys' secondary schools where general and personal hygiene will be taught.

THE SCHOOL CARETAKER

All connected with the school have a contribution to make to the well-being of the child: so the work of the school caretaker in the physical sense and in the contribution that he makes to the atmosphere of the school must not be overlooked. Recognising this, the Central Council for Health Education has added to its courses of instruction a course of three lectures to school caretakers, covering:—1, The child's health needs; 2, Factors affecting health in the school; 3, The school caretaker's part.

Details may be obtained from the Medical Adviser and Secretary, Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1.

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BOOK REVIEWS

THE PSYCHOANALYTICAL APPROACH TO JUVENILE DELINQUENCY. THEORY: CASE STUDIES: TREATMENT. By Kate Friedlander, M.D., L.R.C.P., D.P.M. (Kegan Paul. 1947. Pp. 304. Price 18s.)

Dr. Friedlander writes with vigour and sincerity about problems of which she has much clinical experience: it is not surprising therefore that her book is stimulating, practical, and clearly expressed even when she is expounding details of psychoanalytical theory. She has, like most psychoanalysts, a conviction of the rightness of her basic analytical views which leads occasionally to overstatement and to overuse of the word 'scientific'; but the book is not intended as a cautious report of research, it is an exposition, for a wide non-expert audience, of the psychiatric and more particularly of the psychoanalytical aproach to problems of treating and preventing crime: it succeeds admirably in this purpose. Dr. Friedlander is too experienced and too well-read to maintain that psychoanalysis alone can explain every manifestation of delinquency or provide the right treatment for every juvenile wrongdoing. Psychoanalysis is, however, fundamental in her view for psychological elucidation of the causes of delinquency. Her psychoanalytic views are closely akin to those of Anna Freud; in a pungent footnote she expresses the opinion that Melanie Klein's theory of mental development, which has had so much influence on psychoanalytic teaching in England, "deviates in fundamental principles from Freud's original theory, though it still makes use of Freudian terminology."

In Dr. Friedlander's balanced survey there are three divisions of the theme: the development of individuals towards social adaptation; the failure of social adaptation; and treatment. Illustrative case records are briefly quoted, social considerations given much weight, and the urgency of the problems from the standpoint of the community effectively stressed.

AUBREY LEWIS.

CHILD HEALTH AND DEVELOPMENT, A symposium of Specialist Contributors edited by R. W. B. Ellis, O.B.E., M.D., F.R.C.P. (J. & A. Churchill Ltd. 1947. Pp. 335. Illustrated. Price 18s.)

This book consists of two sections. The first of these deals with the normal development of the healthy child from the time of conception to the period of puberty. Antenatal and intranatal care, the functional development of the fœtus, nutrition, the establishment of feeding habits, dental care, intellectual and emotional development are among subjects dealt with in separate chapters. The second section of the book commences with a consideration of genetic factors and population and of infant and neonatal mortality: outlines the historical development and present-day activities of the organised child health services: contains a study of the English Educational System in relation to pending reforms: outlines the problem presented by the homeless child: explains the place of the juvenile court in the care of child life: and concludes with a chapter summarising the position of milk as an item in the diet of children.

Thirteen eminent authors contribute to this outstanding production

which at the same time as providing a wealth of valuable reference material contains many constructive criticisms and authoritative suggestions deserving the careful consideration of those responsible for future measures for the care of children in health and disease. W. S. CRAIG.

CHILDHOOD AND YOUTH: A digest of child care. Editor, Len Chaloner. (Charles Skilton, Ltd., S.W.19. 1947. Pp. 70. Illustrated. Price 1s. 3d. quarterly.)

This first April–June number justifies its claim to be "an attempt to give readers a condensed survey of what is happening in the various fields of child education, health psychology and so on." A basic article on the essential needs of children by Dr. Susan Isaacs is followed by others on a wide range of subjects—The Curtis Report, Social Factors in Puberty, Soviet Experiments in Co-Education, Nurseries, Child Adoption, Caning as a Punishment, Children's Cinema Clubs, etc. Several of these are reprinted from specialised periodicals such as the *Health Education Journal*. In such cases would it not be well to give dates? In all, sixty pages of good reading matter and nine of pictures make this a publication for which to place a regular order. J. PARFIT.

THOSE SATURDAY MORNING CINEMA CLUBS (A report by the National Under Fourteens Council. Mary Ward Settlement, Tavistock Place, W.C.1. 1947. Pp. 11. Price 6d.)

This admirable little report is the outcome of an investigation into twenty clubs, in various parts of London, run under the auspices of the Gaumont and Odeon groups. Realising that cinema shows specially planned for children contain unlimited possibilities for good, the subcommittee responsible for the report also sees the great dangers which were not foreseen by the promoters of the Saturday morning film clubs.

The Report is a live one: it is interesting and easy to read. Buy one and see for yourself.

P. M. TAYLOR.

THE SECOND FORTY YEARS, by Edward J. Stieglitz, M.D. (J. B. Lippincott Co., Philadelphia and New York. 1946. Pp. 312. Price $2.95.)

The book is written for the American laity and affords a sound introduction to a major problem of our time—or, as the author prefers to call it, of the Age of Age. The chapters fall into three divisions, a series dealing with the general biological and sociological implications of age, or gerontology, interspaced with chapters relating to specific medical problems of the ageing, such as heart failure, blood pressure, nutrition, sex and cancer, and, in conclusion, a medical apologia in which Dr. Stieglitz makes a plea for the concept of constructive medicine.

The fact that the illustrative data is largely drawn from American sources does not in any way diminish the world-wide value of the book. The author is at pains to show that the effects of age are due in part to the results of earlier habits and practices and stresses the need to provide useful employment and satisfying recreation for the second forty years of life.

The author is very complimentary concerning the outlook and methods adopted in this country but he presumes incorrectly that professional and lay opinion is more advanced than the scope of recent legislative measures.

The book is very readable and is strongly recommended.

R. E. TUNBRIDGE.

NUTRITION: DIETETICS: CATERING, a quarterly review. (Newman Books Ltd. 1947. Pp. 46. Illustrated. Sub. 10s. for four issues.)

The public learned much during the war about nutrition and dietetics; they will need to continue learning if what has been gained by necessity is not to be lost when times of plenty return. The task of the food educationist will then be formidable. A new journal, which sets out to inform the public of the elements of nutrition and dietetics and to reform its food habits and its ways of serving food, therefore deserves a welcome. The appearance of this new quarterly is timely.

The journal has begun well. The first number has a foreword by Sir Jack Drummond setting out in plain language what is wrong with our cooking and catering. The editor defines nutrition, dietetics and catering and thus explains in simple language the aims and scope of his journal. Courses for a diploma in dietetics are outlined by the Chief Dietitian of the General Infirmary, Leeds, and also by the British Dietetic Association. The B.D.A. also sets out a model curriculum for a university degree in dietetics. The journal reports the activities of the B.D.A. and of the Food Education Society. We understand that it will publish future proceedings and other doings of both bodies.

Professor Marrack in a short article entitled " Food or Nutrients " reveals some of the errors which may arise from a too rigid appraisal of foods by their content of nutrients. There are articles by Professor Yudkin on his experiences of nutrition in West Africa during the war, by a dietitian on the food supply and dietary habits of the Norwegians and by the President of the Dutch Dietetic Association on the food situation in Holland during the war. Informative though the latter article is, it must be confessed that the diagrams are not easy to follow. It is somewhat disappointing in a journal bearing the title it does to find that catering and cooking have been practically ignored. This defect will doubtless be remedied in subsequent issues. Here lies an almost virgin territory, and it is here that the new journal can be of the greatest service. Sir Jack Drummond's foreword provides inspiration in plenty for many useful articles on cooking and catering.

H. E. MAGEE.

THE ORIGIN OF FOOD HABITS, by H. D. Renner. (Faber and Faber. 1944. Pp. 255. Price 15s.)

It was perhaps inevitable that one of the first essays written on this intriguing subject should be rather in the nature of a 'commonplace book' of jottings and articles. The author has the virtue of not pretending that we know more than we do. The book has a provoking semblance of system in it, that is not borne out (at all events for the present reader) when one comes to peruse it with care. Yet it should be studied attentively because on every page one is compelled to pause and ask oneself some searching question. Mr. Renner takes our food habits, tastes and traditions as a problem in psychology rather than as reflecting certain physiological events that take place during the process of digestion and assimilation. Yet at the same time he contends that many of our tastes have or have had a reasonable origin. All this is very salutary; and if in the course of his argument he tilts at such authorities as Mottram, Drummond and Marrack, they will probably be the first to welcome a new contributor on a very old and perplexing question.

F. LE GROS CLARK.